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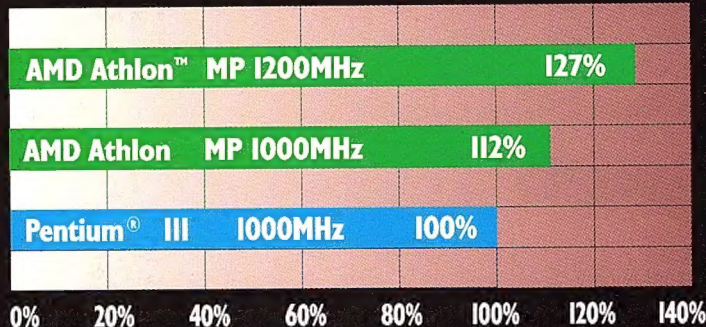
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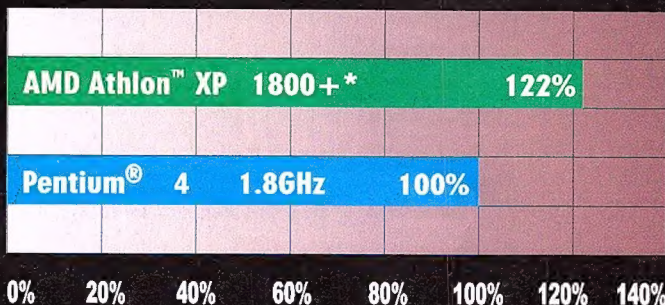
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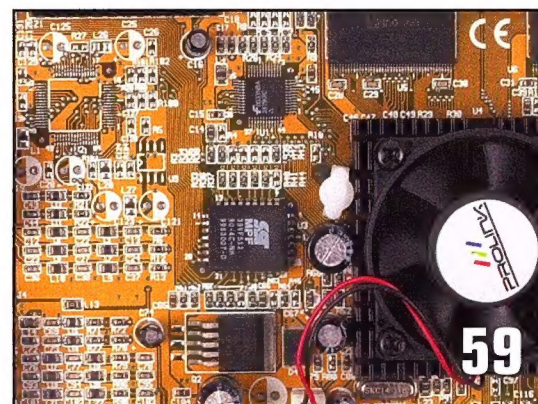
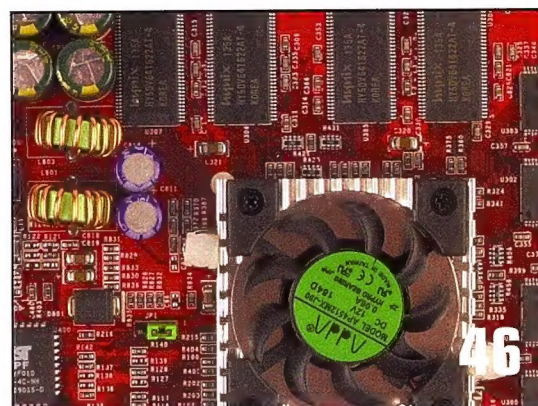
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We can't give you a white Xmas, but how does a competition Xmas sound? Yeah, pretty weird, we know. Due to it being the silly season, we're going totally over the top with comps this month. Not one, but a massive two pages crammed wall to wall with awe-inspiring prizes.

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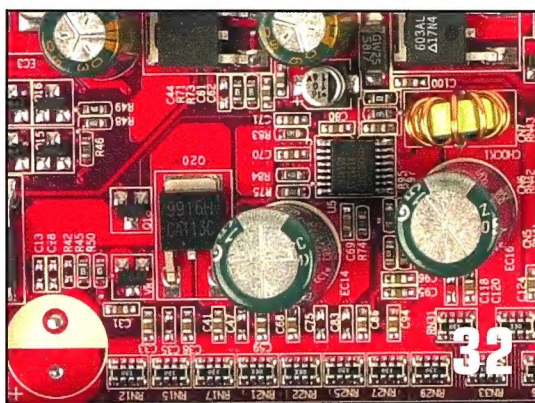
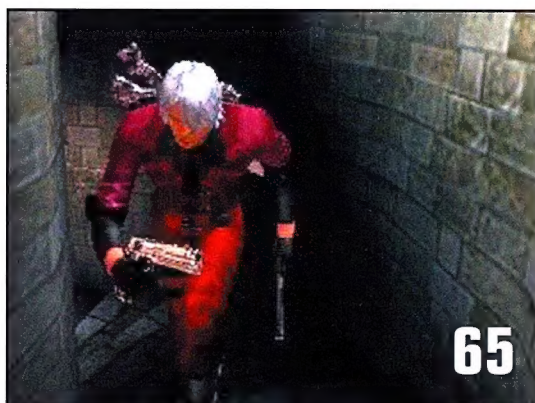
If your PC is feeling a bit hung over from the Xmas season, take it to the I/O clinic.

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NV'us

Did anyone buy 3dfx shares? If you were in a position to, during 3dfx's golden era, investing in that company would have felt pretty safe. Not to mention immensely profitable. It was inconceivable that 3dfx would remain anything but the leader in the field it created. It's hard to think of any other IT company that looked like such a sure thing back then, other than Netscape, perhaps? Microsoft? Intel? Only reckless fools would have invested in the underdogs AMD and NVIDIA.

Fast forward. How things change. While Intel is sound, it has been forced into a radical restructuring as a result of AMD's rapid rise. It released the Pentium 4 prematurely and slashed its prices rapidly. AMD is in a far stronger position than anyone would have imagined a couple of years ago. For the first time, Intel isn't dictating the pace or trends. Meanwhile, it's not quite 'same old, same old' for Microsoft. Perhaps victims of its own success, one could argue. Nevertheless, in IT there is indeed a new world order.

This month's big feature is the NVIDIA nForce. For months we've excitedly been awaiting this product. The nForce features integrated GeForce2 MX graphics, integrated DirectX 8.0-compliant and Dolby-certified sound, plus the first instance of HyperTransport, which is the bright new hope for fast, high-bandwidth motherboards. Pretty hot stuff, really. As our feature shows, a dedicated high-end graphics card is still a vastly superior video option, but that's not the point. The nForce will herald a new era of feasible integrated budget solutions. It presents the right choice for those with older mobos and graphics cards who are ready to upgrade, but can't stretch it to a GeForce3.

NVIDIA, after wiping out 3dfx almost completely on the strength of product superiority, has, with nForce, now entered the chipset market. And with a bang. Traditional chipset stalwarts such as VIA and SiS suddenly have a highly competent new competitor in NVIDIA. As does Sony, with the PS2's Emotion Engine about to do battle with the (mostly) NVIDIA-powered Xbox. And really, NVIDIA also poses a serious threat to both AMD and Intel, as raw CPU power is becoming less relevant than GPU power.

ATI may rock the boat with the Radeon 8500. We hope so. In addition, ATI's Gecko is powering Nintendo's Gamecube, making the emerging battle even more ding-dong. So many GPU makers have fallen by the wayside over the years and, yes, it is ironic that mainstream market, corporate laptop supplier ATI is assuming the role of underdog. But we need that.

The Radeon 8500 is the first graphics card in a couple of years that can seriously compete with NVIDIA's premium product. If that results in NVIDIA dropping prices, then great. If the power of the Radeon 8500 forces NVIDIA to fast-track the NV25, then that's great too.

With Xbox and now nForce it looks good for the company. We just wonder if NVIDIA isn't taking its eyes off the ball with its core PC graphics card business. I'd hate to see it go off the rails there, for our sakes.

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Atomic welcomes all information on new and upgraded products and services for possible editorial coverage. However, we respectfully point out that the magazine is not obliged to either review or return unsolicited products. The editor welcomes ideas for articles, preferably sent in outline form, with details of author's background and samples of previously published work. We cannot accept responsibility for unsolicited copy and stress that it may take time for a reply to be sent out.



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Short Circuits

It was recently a very sad day for the gaming industry when stalwart developer, Sir-tech Canada, closed its doors. As developer of the decidedly old-school Wizardry series of RPGs and the classic turn-based tactical combat action of the Jagged Alliance series, Sir-tech is a company that holds a special place in the hearts of gamers. For Wizardry fans, the good news is that the long, long wait for Wizardry 8 is finally over, with the game appearing in the next few months. But the truly heartbreaking news is that the multiplayer-based Jagged Alliance 3, which is currently in development, will probably never see the light of day.

A lot of early gaming memories revolve around Sir-tech. It was one of the only truly independent developers, financing each game largely through the profits from the last. After almost 20 years in the industry, our gaming will never be the same again.



To prepare us Aussies for the impending launch of the Xbox, the official Australian Xbox Web site has now gone online. Head over to www.xbox.com.au to check out everything Xbox related, but make sure you cover your keyboard to stop the inevitable deluge of saliva dripping into places where it shouldn't.

XBOX UNLEASHED: NY City 2-3.11.01

'Xbox Unleashed', part of Microsoft's \$500 million Xbox marketing blitz (scooped from beneath Bill Gates' sofa cushions) hit New York in November. In anticipation of the console's 11 November launch the two-day event was the first chance for the public to sample Microsoft's much-hyped wares. Naturally, the scene was mobbed with game fans and hardware ogglers from New York's five boroughs and beyond. And to the surprise of those who saw Microsoft's lacklustre gameplay at E3 last Spring, the wares mostly looked and played well.

It's been tough not to doubt the claims that this machine runs twice as fast as two PlayStation 2's, but there was no question that loading times and frame rate problems have been solved since E3. Games such as the first person shooter, Halo, ran quick and clean and looked stunning on the high-definition plasma and LCD screens liberally peppered throughout the cavernous nightclub.

'We're looking at a system that's designed, ground up, to free game designers to kick ass,' gushed Xbox general manager, J. Allard. 'A lot of people call this a glorified PC. Wrong. Okay, the operating system is similar to the Windows 2000 kernel. But it certainly can be more optimised than Windows XP.' What's more, explains Allard, the Xbox uses its own version of DirectX 8.0, designed for the console's particular features. Allard argues that testing, debugging and code optimisation will be easier on Xbox, too, because of

standardised software and hardware. 'There have been a lot of complaints from game developers about the PlayStation 2 dev tool. We've had nothing but positive reports.'

True, Xbox should outperform both Gamecube and PlayStation2. But the box's Intel Pentium III 733MHz CPU looks weak next to a high-end PC running a 2GHz Pentium 4 or 1.6GHz Athlon. Memory, at 64MB unified, also pales in comparison to a typical gaming PC's 256MB plus 64MB of video RAM. In main memory bandwidth, the Xbox works at a supposed 6.4GB/s shared with the rest of the system versus up to 4.26GB/s on a Pentium 4 on the RAM alone (though slowdowns on motherboards work against the PC). Of course, all these numbers are subject to change. And soon. It's likely that about a year from Xbox launch, a high-end PC's performance will stomp Xbox into microchips.

In the end, software sells systems. PlayStation 2, with hundreds of titles and a wave of excellent second-generation games, still seems a reasonable choice. And although Nintendo's Gamecube launches with a dearth of decent games, the company makes lots of neat software, though mostly for the kiddies.

Does Xbox's entry into the market toll the death knell for PC gaming? Not likely. In fact, because of the ease of porting games between PC and Xbox, we may even see an increase in action/adventure games, traditionally released only on consoles. □

Atomic WorldLAN GibFragCON: XP

You've been to the Atomic m337; now come to the Atomic LAN. That's right - there is an Atomic LAN happening! It's been conceived and organised largely by Atomican Luke Gardiner (aka MAD_MAN_MODZ) with help from Allison Reynolds (aka Gramyre), and a pack of others, more of whom are probably joining the team as we speak. Bravo chaps! Atomic WorldLAN GibFragCON: XP is being held in the name of the good causes of getting together and doing a good thing, as all profits will be donated to the MS Society of Australia. We're gunning for at least a couple of hundred rocking up. There will be some sort of door charge, of course, but we haven't done the maths on that yet. Next month we'll be able to lay the whole plan out for you. Watch www.atomicmpc.com.au in the meantime.

Atomic WorldLAN GibFragCON: XP will be held at La Trobe University in Melbourne, over the 18th and 19th of January. The two-day plan at this early stage in the planning cycle is for Friday as a practice session and 'meet and greet' affair. Saturday will be the big day for serious gaming. There will be multiple competitions in games such as UT, CTF, Q3A, CS, Starcraft and whatever else you want. We're swinging deals to

ensure nice stuff for you to win, and generally free (or close to it) personal comfort items. Big Game winners will be treated like Kings. Or Queens. WOOT! □



📍 Awesome logo under construction

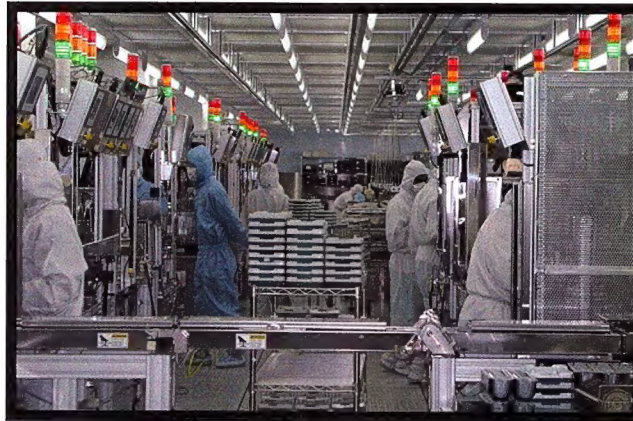
Let's CETEC what Seagate is up to

Atomic recently toured Seagate's Singaporean manufacturing plant. The tour began with a walk through its new 'Factory of the Future' (FOF) automated production lines. We were expecting to see a few tamed Cybermen or IG-88's roaming around the production floor, but the robots doing the work in the FOF aren't of the bipedal type. Instead we were faced with eight long rows of machinery, with each of these rows being a single production line. A couple of white-clad staff manned each line, ensuring that the robots kept churning out hard drives and didn't start getting any ideas about global domination.

And churn out hard drives they did, at the phenomenal rate of between 8,000 and 20,000 units per day, per line. That's anywhere between 64,000 and 160,000 hard drives built in one day. It's a good thing robots don't get tired.

When asked if the move to robotic workers was in any way motivated by a desire to lower labour costs at Seagate, the answer was a resounding 'No'. It seems Seagate had no choice but to use robotic labour, as human beings are just too filthy to work around devices that can be destroyed by a single speck of dust. The move to an automated production line also makes it simpler to determine where flaws are occurring and which sections of the production line can be further refined.

Next up was the grand unveiling of the new Consumer Electronic Testing and Engineering Centre (CETEC). This is the second CETEC that Seagate has opened, the first being in Colorado in the US. According to market

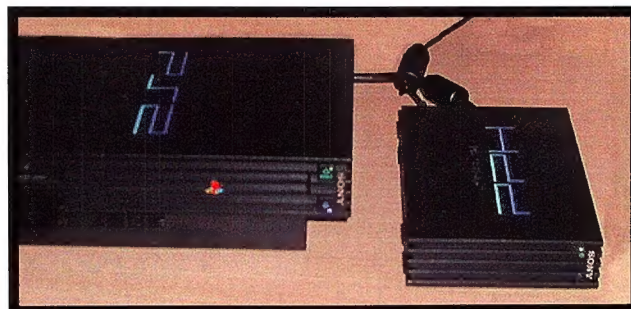


① To the left and right are separate automated lines within the FOF

analysts, enterprise and home PC hard drive sales are going to be flat for the next couple of years. Compare this with the predicted growth rate of around 500% for hard drives within consumer electronics (CE) devices over the next year, and you can see why Seagate is keen to make sure it is hard drives that are storing the data for said CE products.

CETEC is a place for the manufacturers of CE devices (MP3 players, console hard drives, digital video recorders, set-top boxes, and so on) to test out their prototypes with Seagate drives. After setting up each device with a Seagate drive, they are run through a gamut of tests. These include vibration testing, drop testing, climate testing, acoustic testing, performance testing and packaging testing. In other words, Seagate thrashes the utter crap out of each device to check that the hard drive won't stuff up. Acoustic testing is one of the most important steps, as CE devices need to be totally silent when running, and the mounting of a silent drive in certain configurations can lead to unexpected noise. If a flaw is detected, it's back to the drawing board for that product.

It was interesting to see that the hard drives within these CE devices differ slightly from those within PCs. A hard drive for a PC requires 100% data integrity, which means that if screwy data has been retrieved, the hard drive must go back and fetch the correct data. Otherwise you'll get data corruption or crashing applications. In a CE hard drive, consistent data streaming is the key. It's better for a CE drive to drop a frame here and there than to have to pause the playback while it retrieves the correct data.



① A PlayStation 2 prototype hard drive.

Short Circuits

While Atari 2600 emulators have been around for sometime, some of us still prefer the real thing. Physical degradation of the cartridges (along with getting your hands on them in the first place) can quickly put a halt to your long-term marriage plans to your wood-grained love. The Cuttle Cart is the second venture into video game preservation for Schell's Electronics (www.schells.com) after the successful Intellcart for Intellivision. While they won't go into mass production, they have quickly gained the attention of retro-gaming enthusiasts everywhere. The Cuttle Cart works by simply converting your stored ROM files into WAV audio files, which can then be output from a sound card or CD player, directly into the Atari 2600. Each unit costs \$US100, but it's a small price to pay for the security of knowing that all your ROMs can now sit safely in their non-degradable state forever and ever.



It's official. Telstra has implemented a 3GB cap on both cable and ADSL home accounts. Breach this and you'll be paying 18.9c/MB up to 5GB, after which it will cost you 17.5c/MB. Does this mean its incredibly inaccurate usage meter will be fixed? It had better be, or else we can expect the howls of protests to start happening.

Short Circuits

With one Pentium 4 DDR chipset on the market, and another just around the corner, the viability of SDRAM for the Pentium 4 is being called into question. While VIA is having problems getting first-tier mainboard manufacturers to use the P4X266 chipset, SiS now has a fully licensed DDR chipset on the way in the form of the SiS645. The reaction from Intel is to accelerate the release of its 845 B-Step chipset, which adds DDR support to the low-cost Pentium 4 solution. Rather than late first quarter 2002, expect to see boards based on this solution in December of this year. This isn't to say RDRAM is dead, but a bright spot for its future faded when speculation that SiS would announce a Pentium 4 RDRAM chipset was emphatically denied by SiS.

Tom's Hardware recently released a HSF failure video demonstrating two Intel CPUs surviving HSF removal, while two AMD chips under the same test went up in a haze of blue smoke and acrid fumes. AMD obviously wasn't too impressed with this, and released its own video showing the Palomino Athlon surviving the same tests for over nine minutes. Needless to say, Tom took several hits from numerous other hardware sites regarding his testing methodologies. In the meantime, it has come to our attention that the AMD video uses motherboards with built-in thermal protection, due to the Palomino not having a kill switch built into it. So if your mobo supports thermal protection, you can be sure your shiny new Athlon XP won't fry if your HSF dies – or if you're 'absentminded' enough to remove it during a Q3A frag fest.

DirectX 9.0

Microsoft is set to update its DirectX suite of APIs. With beta testing about to commence, developers are anxiously awaiting the new and updated features version 9.0 will provide.

DirectX 9.0 will include the use of 'scissor panes', a feature currently found in OpenGL, but never before seen in DirectX. This means that pixels can be clipped by putting a box around the view. In other words, your system won't need to process code for parts of the screen that are not visible, saving precious CPU and GPU cycles for other stuff such as DirectX programmable shaders used with fog effects.

Pixel shading allows the colour of individual pixels to be manipulated. The version 2.0 Pixel Shader expected in DirectX 9.0 will provide a marked improvement in this control and will mean the introduction of an amazing array of texture registers and blending, which aren't restricted by the API.

Gamma correction will also feature. This is going to greatly improve the appearance of models and textures, as lighting effects will be far more controlled and detailed.

We will finally get to see

64-bit colour depth with DirectX 9.0. Currently 32-bit colour has 256 levels of intensity per channel; 64-bit will see a staggering 65,536 levels per channel.

It is speculated that DirectX 9.0 will include NURBS (Non-Uniform Rational B-Splines). NURBS are used in the representation and design of geometric shapes and surfaces as an alternative to polygonal models. A spline, in basic terms, is a curve or plane (or a curved plane), which is defined by a series of control points. More points mean more definition. By adding, taking away or moving the control points around, you alter the shape of the curve. Because it is only the control points that are modified to alter the shape, it means much less processing overheads. NURBS can be used to represent standard geometric shapes such as circles, ellipses and spheres as well as more free-form shapes such as body parts, weapons and teapots.

OpenGL, which has been around for close to a decade, is becoming somewhat redundant in PC gaming development. DirectX 9.0 will be another nail in the OpenGL coffin, at least on the PC platform. Microsoft's DirectX is clearly and understandably the API suite of choice among developers. Part of the reason for this is that OpenGL is dependent on different extensions for various platforms (for example, ATI extensions, NVIDIA extensions and so on). This also means that there is the possibility of different hardware platforms producing different visual results. This is in contrast to DirectX, which could be described as one environment for all platforms.

C/C++ is currently the more popular language for coding for DirectX. C# (still in beta), as a language, will probably be preferred by many programmers due to its similarities to Java programming, but C# testers have indicated that coding for DirectX 8.0 is a little trickier. It is hoped that version 9.0 will address this.

Developers will also be interested to know that DirectX 9.0 will not require the use of the VB typelib and there will be no need to go through COM (Component Object Modelling) interop. There will be specific .NET libraries available as Microsoft move steadily towards the .NET architecture we have been threatened with for some time.

At the time of writing, Microsoft was looking to get a beta version of DirectX 9.0 out to testers for . . . well, testing. As yet there are no firm dates available for DX9's final release. □

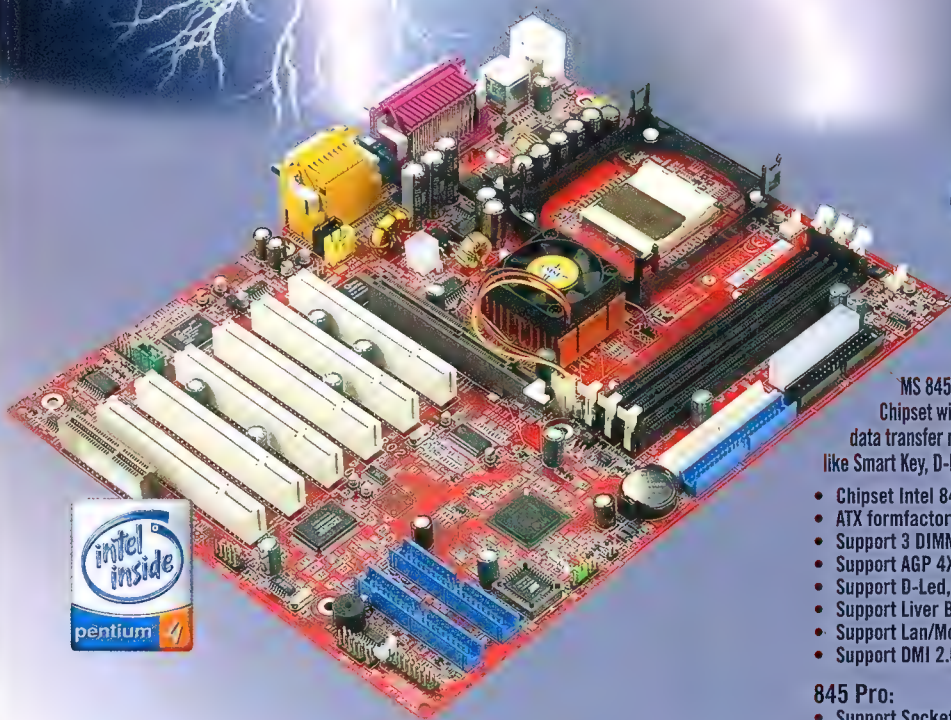
What's HOT

- Santa
The giver of free stuff cometh
- Xbox
The return of the American console
- Athlon XP
Continuing the legacy
- RADEON 8500
The bleeding edge of graphics hardware
- NVIDIA drivers
Blissful

What's NOT

- Satan
What has he ever done for us?
- Cardboard box
Let down by appalling frame rates
- Thunderbird Athlon
It had to be beaten one day
- GeForce3 Ti 500
More of the same
- ATI drivers
By now you think they would have got it right

Miracle of Digital Power.



Smart Key



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The Jargon File

Ashton Mills speaks in tongues, but we understand him.
Really we do. Stop looking at me like that.



Chances are you haven't heard of Eric S. Raymond – unless you play in Linux and open source circles – but he's a bit of a legend in the world of software development and, more than this, he's the author of a defining work that catalogues a culture. Specifically, our culture.

He's most famous for writing a paper called *The Cathedral and the Bazaar*, an analysis between the different development methods of in-house project-based software development and the diverse, shared, worldwide model that is open source. It is such a powerful piece that it motivated Netscape to publicly release the source code to its Web browser back in January 1998, the result of which is now seen in the open source browser Mozilla.

But the main work of which I speak, and one of Raymond's greatest accomplishments, is the ongoing project of the Jargon File, otherwise known as *The New Hacker's Dictionary*. This seminal work is all about, and was made for, people like you and me.

The best description of this great work comes from the File itself: 'This is the Jargon File, a comprehensive compendium of hacker slang illuminating many aspects of hackish tradition, folklore, and humor.'

As an example of what you will find in it, and given the official title of *The New Hacker's Dictionary*, let's start by putting to rest the age-old debate about what exactly a hacker is:

hacker n. [originally, someone who makes furniture with an axe] **1.** A person who enjoys exploring the details of programmable systems and how to stretch their capabilities, as opposed to most users, who prefer to learn only the minimum necessary. **2.** One who programs enthusiastically (even obsessively) or who enjoys programming rather than just theorising about programming. **3.** A person capable of appreciating hack value. **4.** A person who is good at programming quickly. **5.** An expert at a particular program, or one who frequently does work using it or on it; as in "a Unix hacker". (Definitions 1 through 5 are correlated, and people who fit them congregate.) **6.** An expert or enthusiast of any kind. One might be an astronomy hacker, for example.

7. One who enjoys the intellectual challenge of creatively overcoming or circumventing limitations. **8.** [deprecated] A malicious meddler who tries to discover sensitive information by poking around. Hence "password hacker", "network hacker". The correct term for this sense is **cracker**.

By Raymond's definitions, Atomicans are hackers too – hardware hackers. I think this is apt, especially in relation to overclocking and cooling where, most certainly, we enjoy 'the intellectual challenge of creatively overcoming or circumventing limitations'.

It's impossible to do the Jargon File justice in this short column, but suffice to say it's packed with gems of wisdom. For example, Raymond's definition of copy protection: 'A class of methods for preventing incompetent pirates from stealing software and legitimate customers from using it. Considered silly.'

Under 'management' we read: 'Corporate power elites distinguished primarily by their distance from actual productive work and their chronic failure to manage (see also suit).'

Eric covers everything from 'All your base are belong to us!', Dilbert, and Gates' Law through to The Matrix, PrOn and Zawinski's Law. Much of the time you will discover the history behind our lexicon as well. Ever wondered where 'newbie' (now evolved to 'n00b') comes from?

'[Very common; orig. from British public-school and military slang variant of "new boy"] A Usenet neophyte. This term surfaced in the newsgroup *talk.bizarre*, but is now in wide use (the combination "clueless newbie" is especially common).'

The Jargon File does more than document the words of our culture – it also documents our culture itself. If you browse these hallowed pages, be sure to check out *A Portrait of J. Random Hacker*. I'm certain you will recognise yourself in Raymond's eloquent descriptions. The anecdotal stories in *Hacker Folklore* will make you smile, and the introductory *Crackers*, *Phreaks* and *Lamers* humorously explains how to talk like a 133t hax0r, which is surely where Jeff K. (who even rates a mention) honed his particular craft.

Eric S. Raymond's writings

■ The Jargon File

www.tuxedo.org/~esr/jargon

■ The Cathedral and the Bazaar

www.tuxedo.org/~esr/writings/cathedral-bazaar

■ How to Become a Hacker

www.tuxedo.org/~esr/faq/hacker-howto.html

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Brain-rooting game

Tim Dean is suffering from an unusual bipolar disorder, and now he sucks at Counter-Strike.



I think it was the developer Bethesda, with games like Daggerfall and SkyNET, that introduced me to mouselook (which, for those non-gamers out there, means using the mouse to look around the game world in a first person perspective). The funny thing is, when it comes to using the mouse to look around the game world, there are two quite distinct, and quietly hostile, camps.

Camp one, tentatively referred to as 'normal mouse' (pfft – like that gives them more credibility . . .) uses the mouse much as you would in Windows, where moving the mouse forward corresponds to 'up', and moving the mouse back or towards your body corresponds to 'down'. The second camp, generally called 'reverse mouse', is the opposite of the normal mouse stance. They move the mouse forward to look down, and pull the mouse back to look up – this is often described in terms of flight simulators, where pushing the joystick forward pushes the nose down.

On the surface, it seems fairly banal which camp an individual falls into, although this is far from the truth. Interestingly, in just about all cases (except one freak case that continues to defy me – Aeon . . .), people fall into one, and only one, of these camps. Furthermore, they quite simply refuse to believe that the other camp is a viable option, and often cringe when considering moving the mouse in the opposite direction to what they are accustomed to.

Just looking at the expression on a person's face when they sit down at someone else's PC and try to play using the host's config, only to find the host sits in the other camp, is enough to demonstrate clearly that this is no normal arbitrary preference thing – it runs deeper than that.

Now, as of a couple of months ago, I was a staunch reverse mouser, and I laughed with mocking contempt at those fools who used normal mouse. Funnily enough, karma 'turned' on me. And, frankly, I think I deserved it. The catalyst was Operation Flashpoint. Awesome game. Loved it. The only bummer was that the mouse didn't operate quite like it does in other first person shooter (FPS) games. In most FPSes, if you move the mouse at all, the crosshair stays fixed relative to the centre of the screen, and the rest of the screen moves around it. In Flashpoint, when you move the mouse a small amount, the screen stays fixed, and only the aiming crosshairs move – if you move the mouse more, the crosshairs stop, and the rest of the screen moves.

Only a small change in interface, but it proved to be pivotal to my psyche. The thing was – when just the crosshairs moved a bit, my brain (curse it!) wanted to treat it like a mouse pointer. As such, I wanted to move the mouse forward to make the crosshairs go up. However, when the screen moved, my brain switched to reverse mouse again. Headaches ensued. I found to my dismay that the only way to play Flashpoint without having an aneurysm, was to play it in normal mouse. By gum, I didn't tell anyone I had 'turned'.

A month or so later, once I had gotten over my initial Flashpoint binge, I fired up Counter-Strike (ironically, it was at Bennett's place). And bugger me if I couldn't hit the side of a barn with the auto shotty. All of a sudden, when playing with my usual reverse mouse config, I was running around like a newbie, alternatively pointing at the sky, then my feet. In the end, I had to change my config, and become a fully fledged normal mouser. A month down the track I'm still learning to adjust, but all I know is that I can never go back.

Another major bummer is that I can no longer bag out the other camp. Like some kind of rolling stone, wandering drifter dude I don't feel like I belong to either camp anymore – man.

When trying to figure out this weird facet of human nature and cognitive process, I asked my colleagues what they thought and why they chose their respective camp. After much polling, I came to the conclusion that the two camps imagine their in-game avatar in very different ways.

A normal mouser pictures their game-self moving their head or eyes around as they manipulate the mouse, while a reverse mouser generally has a more full-bodied appreciation of their avatar. As such, it kind of makes sense when thinking of controlling just the head or eyes to move the mouse up to look up, and it also seems plausible to move the mouse forward to move your whole torso forward and down. In fact, try thinking of this the other way around – preferably in front of a mirror so you can laugh at the pained expression on your face as certain neurons begin to fire in ways they just were never intended to.

I reckon it must be a fairly deep-rooted thing in the way our brain processes sensory input, and while it might be arbitrary how you begin to think of your in-game avatar, once that is set, then the way you use a mouse is fixed for good (at least until something like Flashpoint comes along and messes with your brain). My final thought: as a fence-sitter in the camp debate, and one who has tasted the fruit from both trees – geez people! – it really doesn't matter what someone uses, as long as it's not an aimbot. □



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Damned lies and marketing

Dan Rutter's perfect world revolves around the DanSpeed Architecture. He D-Rates Atomic @ 4 trillion DHZ.



'Fortunately, the Athlon genuinely performs, for both integer and floating point tasks, like a faster clocked Pentium 4.'

Marketing people. Don't you love them? They are truly the grease that allows the mighty wheels of commerce to turn. And they're so helpful. Why, if there was one handy, I'd probably be given a better metaphor to use. One that didn't refer to marketing people as 'grease'.

I'm feeling mellow right now because I haven't been all that horrified by a couple of recent marketing efforts in the PC CPU business. Any minute now a marketroid will birth another campaign that explains how its brand of CPU is essential for a dynamic, gonad-tingling Internet experience, but until that happens I'm going to lay off.

I actually feel for the people trying to market VIA's current C3 CPUs. An 800MHz C3 loses by a substantial margin to a 600MHz Celeron in any benchmark you care to name, despite costing more. But the C3 only draws on an average of 5W in normal use; it runs very cool. Presto, a marketing line. This CPU is 'cool'!

VIA first points out that the C3 runs cool, which is true and important for battery-powered devices, and for anyone trying to build a silent no-fans PC. VIA then goes on to rave about the C3's Cool Technology, Cool Performance, Cool Innovation and Cool Value. I think VIA then created a distraction and ran for its life. Fair enough, I say. I doubt I could have come up with a better strategy.

AMD is dealing with the opposite problem. It is, at the moment, producing Athlons that outperform Intel Pentium 4s running at the same clock speed, and offering rather better value for money. Never mind who's got the fastest money-is-no-object processor; most people don't care much about 5% either way in the benchmarks, as long as they get a PC that's more than \$1,000 cheaper.

And yet Joe Average keeps buying the expensive Intel chips because they've got a higher clock speed, and must therefore be faster. Joe probably understands that a 2.2L Toyota Camry is not 10% faster than a 2L Honda S2000, but he hasn't quite managed to reach a similar realisation about PC processors.

If I was AMD, my ad motto would be something like: 'Athlon. It's faster. It's cheaper. What are you, some kind of idiot?' It's probably just as well I'm not AMD, all things considered.

What AMD has instead decided to do is cry havoc and let loose the dogs (or possibly the grease) of marketing, and the result has been 'QuantiSpeed Architecture'. AMD hasn't said anything official about QuantiSpeed yet, but it's in its list of trademarks and there have been various leaks. So by the time this makes it to print, I bet you will have heard the term.

QuantiSpeed is a new take on the old 'P-Rating' idea where CPUs are specified not by clock speed, but with an abstract number that indicates the clock speed of the competing processor a given chip is meant to equal.

You tell your sales department to mention clock speed as often as Heinrich Himmler mentioned rather liking bagels, you turn a blind eye to the fact that many people are going to incorrectly assume that an 'Athlon XP Processor 1800+ with QuantiSpeed Architecture' runs at 1800MHz instead of 1533MHz, and then you buy yourself a monocle and a white fluffy cat and start talking with a zoologist about the care and feeding of the alligators that will swim in the Death Pool in the underground fortress you'll be buying with your profits. I think that's the plan, anyway.

The P-Rating concept earned itself a bad reputation when AMD and Cyrix used it last. An IBM/Cyrix 6x86-300 CPU, for instance, actually ran at 233MHz. It was, for 3D games, not much better than a 200MHz Pentium.

Fortunately, the Athlon genuinely performs, for both integer and floating point tasks, like a faster clocked Pentium 4. Yes, there are exceptions, but for most desktop computer tasks a 1.4GHz Athlon system shows a more expensive 1.7GHz i850-chipset Pentium 4 a very clean pair of heels. So, in the Big Book of Marketing Cheats, this one doesn't really rate.

QuantiSpeed Architecture doesn't address the other reason why people buy Intel systems, though. If you want something with one minute of downtime per year, a cheap grunty Athlon box is more likely to have unacceptable personality defects than will an expensive, somewhat slower Pentium 4 system.

Given the market success of Windows 98 and Me, though, I can only conclude that ironclad reliability isn't a high priority with most shoppers.

So roll on QuantiSpeed, I say. Sure, it sounds like an unpopular Transformer who only gets to transform into a particle accelerator. But if it persuades people to buy better computers for less money, then maybe the marketroids have done something good for a change.

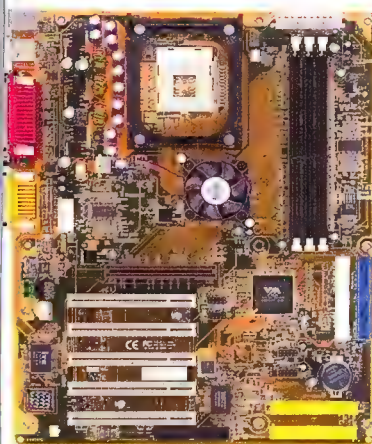


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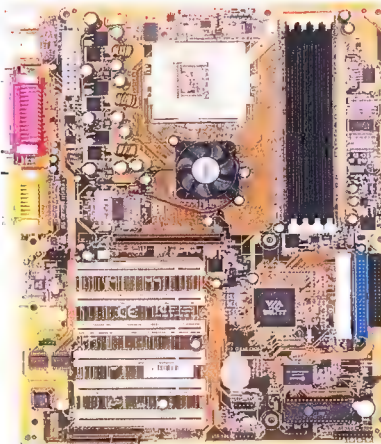
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The Darkkon Box



Technical details

- PIII 800MHz @ 900MHz
- ASUS CUSL2-C motherboard
- 512MB PC133 RAM @ 150MHz
- Western Digital 13GB HDD
- Fujitsu 6GB 5,400rpm HDD
- ASUS V7700 GeForce2 GTS
- SB Live! DE (5.1)
- Affrey 10x DVD-ROM drive
- Sony 48x CD-ROM drive
- Alpha PAL6035 heatsink
- Realtek NIC
- Round ATA100 cable
- Four 60mm and two 80mm fans
- 60 to 80mm fan adaptor

The story

I was sick of beige, but lacked the talent and willpower to paint my case. Reading one case-painting guide was enough to put me off it forever. Then I was struck by inspiration . . . CONTACT! Yes, the thin, vinyl, adhesive sheets that cover so many schoolbooks would be the perfect way to transform my case. With a little planning and a bit of practice, I was able to get the contact to work miracles on every surface of the case, leaving me with a pleasingly black exterior. For

the CD-ROMs, I removed the entire front face and simply hit them with black permanent marker. I didn't do the buttons because the marker will wear off if you keep touching it!

Other features of the case are dual 60mm intake fans in the top, dual 60mm exhaust fans at the back, an 80mm intake fan at the front, and the 80mm fan sitting on the heatsink. I cut out a bit of the front/bottom area of the case to allow more air to enter the front, and illuminated it with blue LED.

Jon's Mann Beast



Technical details

- Duron 850MHz @ 1.03GHz
- 512MB PC133 SDRAM
- ABIT KT7A
- Eagle GeForce2 MX400-64/TV
- Sound Blaster Live! Value
- Pioneer 16x DVD-ROM drive
- Ricoh 16x/10x/32x burner
- Two blue ORBS (Northbridge and VGA)
- Red and blue rounded IDE cables
- Window in generic monitor
- One 92mm fan on monitor
- Lots of coloured LEDs
- A cold cathode light

The story

As soon as I saw a PC with a window, I thought 'Hey, I can do that'. So I did. I cut the window hole with a jigsaw, and then found some flexible bushing strip to go around the edges. I was going to use that stuff that comes with the kits, but I think the bushing looks better. That looked so good I decided to do it to the monitor as well.

The water cooling setup is made from an aluminium waterblock, aluminium transmission cooler and a 240V pump from Bunnings. It

took me a while to get it right, but it was well worth it. The efficiency of the water-cooling system is very good; I managed to get an 850MHz Duron up to 1.03GHz at 21°C while it was idle. The next step will be a Peltier system and a totally custom case, but I'm still working on that.

After all that, I would have to say that the most rewarding thing about this mod is having it published here, in the greatest magazine of all time – Atomic.

Martin's Ace



Technical details

- Athlon 1.4GHz @ 1.47GHz
- ASUS A7M266
- 512MB DDR RAM
- IBM 40GB HDD
- Leadtek GeForce3
- Acer 40x/20x/10x CD-RW
- Just Cooler HDD cooler
- AOpen full tower case
- Dual cold cathode lights
- 16 fans
- Three FireWire ports
- Chrome LAN handles
- Perspex window
- 10 coats of paint

The story

After selling my old Celeron and buying my Athlon (as a result of Atomic's recommendations), I got worried that she might be feeling claustrophobic. So I gave her a perspex window to look out of. Next I started to worry that she might be feeling hot, so I put in 16 fans to cool her down. In return for her gratefulness, she works real hard to keep my system fast and stable. I sprayed six coats of auto paint and four coats of clear glaze paint. Still not satisfied with the shine, I

decided to use Turtle Wax, totally ruining the finish and killing the shine. Two chrome handles for carrying to LANs and the two coloured neons give the illusion that it is running as cool as it looks. Four fans on the side panel blow cool air onto the motherboard and CPU, and the rest of the fans suck air out through the front, back and top. There's also a hard disk cooler for the HDD and a 20x CD-RW drive for speedy burning. The only thing that's needed to finish my mod is an Atomic sticker (*wink, wink*).

Gremlin's Bus Box



Technical details

- Athlon 1GHz
- Elitetgroup K7VZA
- 256MB PC133 SDRAM
- Seagate 30GB HDD
- GeForce2 MX 200
- Samsung 12x DVD-ROM drive
- SAMTRON 75E 17in monitor
- Zippy infra-red keyboard with pointing device
- Two case fans
- TV and FM radio tuner card
- Creative Vibra 128
- Four wheels
- Engine

The story

The problem given to me by my mother-in-law and her husband: how to fit a computer into a 32ft mobile home with very limited space.

With all the parts in hand, how and where were we going to fit it? The space next to the split-system airconditioner looked about the right size. A couple of panels cut to fit by a local cabinet-maker provided the front, and a butchered ATX case provided somewhere to fit all the important stuff.

Holes were cut into the front with a jigsaw for the FDD and DVD. Some switches and LEDs purchased from Dick Smith were fitted so we could turn it on.

The rest screwed in where it fit best and where it could get the best airflow. A zippy infra-red keyboard/mouse combo was used. For the monitor, an LCD screen was ruled out due to pricing and viewing angle problems, so a 17in CRT had to do. With the bus having solar panels and an inverter we have an unusual mobile computer.

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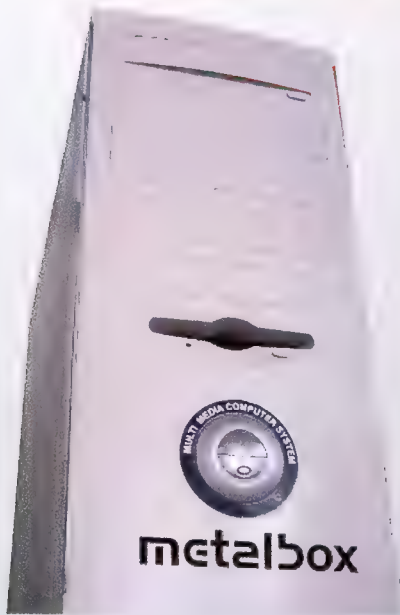
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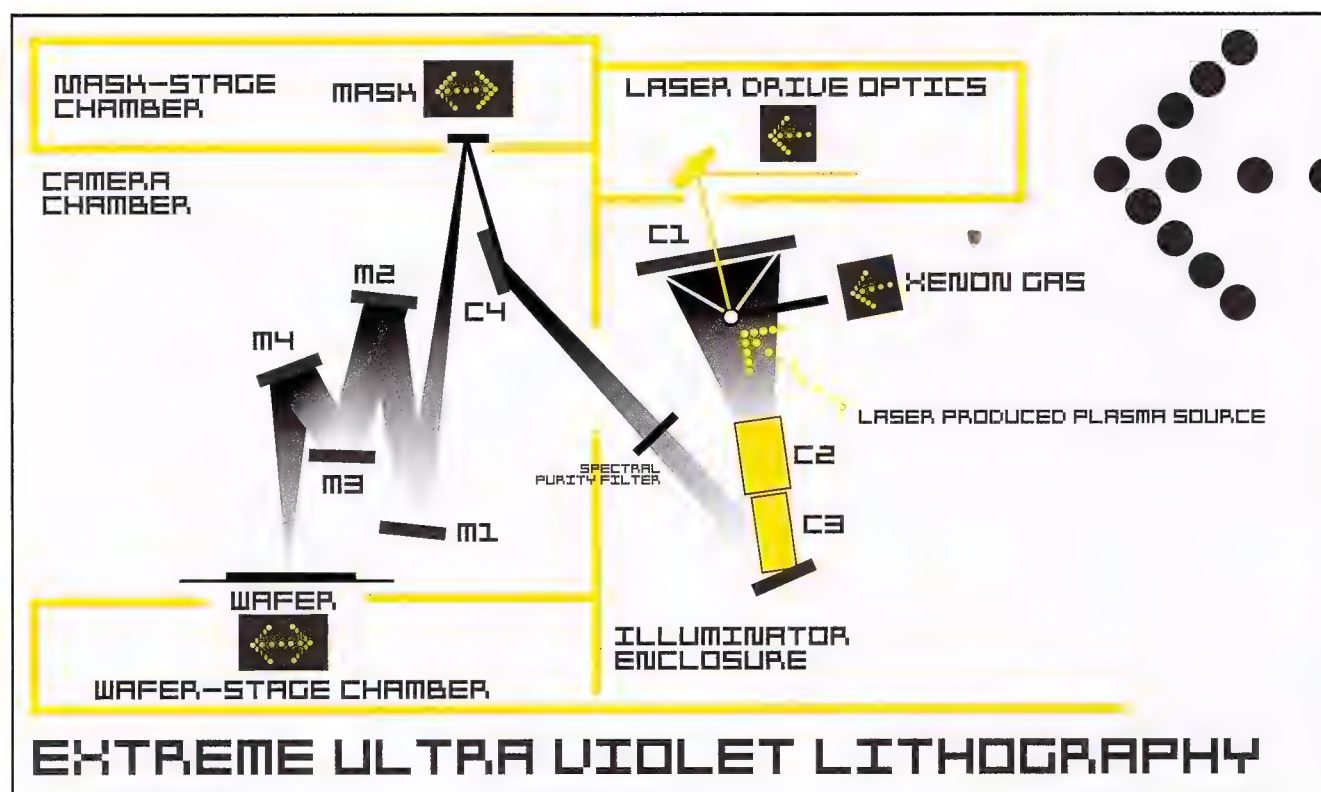
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CPU MANUFACTURING

Simon Peppercorn turns into a microprocessor, asks himself 'Where did I come from?', then morphs back into an Atomic writer and answers his own question.



In 1964, when Bill Gates was still trying on propeller caps, electronics engineer, Gordon Moore, made an observation. He predicted that the number of transistors that could be squeezed into a small chunk of silicon would double every 18 months. This has come to be known as 'Moore's Law', and you can still read his paper at www.intel.com/research/silicon/moorespaper.pdf. Moore even predicted that future microprocessors would be able to fit 65,000 transistors in one chip.

In 1971, Intel coughed up a microcomputer chip with arithmetic manipulation. It ran at a blistering 108kHz, and contained a whopping 2,300 transistors. Geekdom was amazed.

'Pfft!', said Intel, 'That's nothing – watch this . . .' And with a wave of its magic wand, and 20 years of development, the Pentium 4 was released. Not happy with reaching the 65,000 transistors predicted by Moore, Intel and other manufacturers have pushed the envelope to extremes. Today's CPUs, like the Pentium 4, now happily pack up to 42 million transistors into one itty-bitsy wafer of silicon.

Please Sir, may I have some Moore?

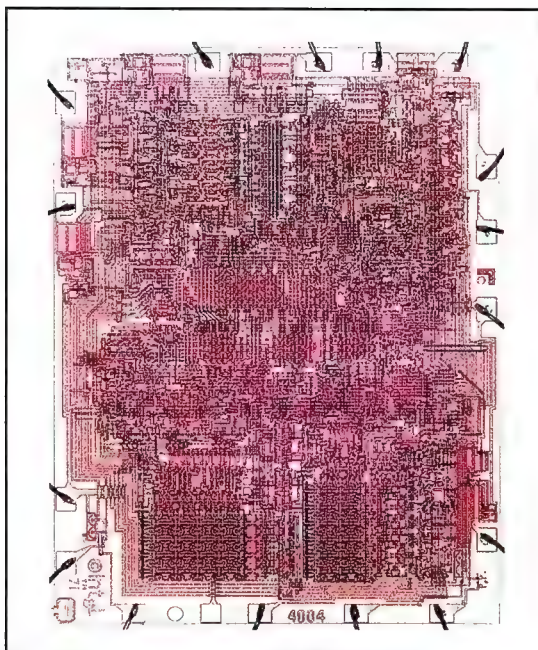
Flashback to pre-1950 when primitive computers were operated with mechanical switches and vacuum tubes. In July 1958, a group of employees at Texas Instruments decided to go home for the holidays. A young chap named Jack Kilby, who was new and eager to impress, chose to hang around the office instead. Between cups of coffee and games of Counter-Strike, Jack conceived the idea of a complete and integrated

circuit. He figured that rather than manufacture and package a bunch of components separately, it would make better sense to produce one chip that contained all the necessary components – such as resistors, capacitors and transistors – connected together. With no-one around to distract or deter him, and with the labs pretty much to himself, he was able to bang up some sketches of his concept and build a model. Following a few attempts, and using adapted, off-the-shelf parts, the integrated circuit was born.

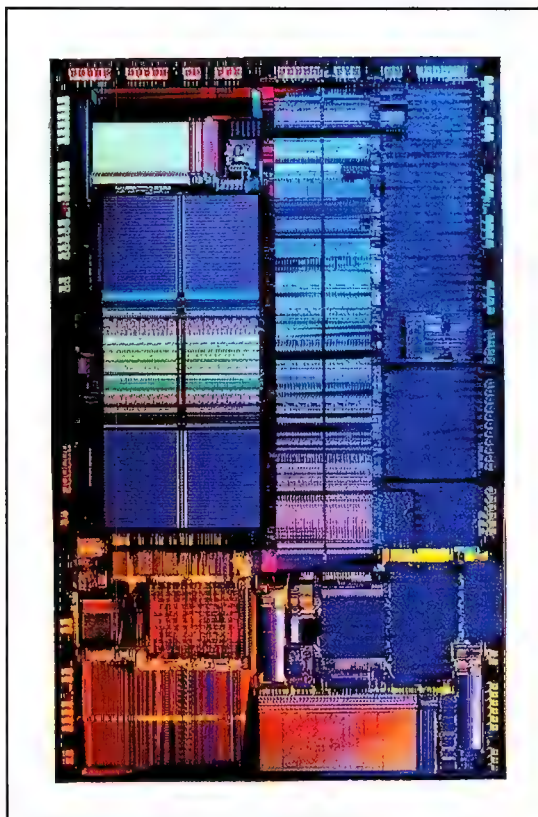
At around the same time a fellow named Robert Noyce, along with Gordon Moore of Fairchild Semiconductor, were working on a similar concept that involved wiring together transistors to create a circuit contained within a solid block of silicon. This would allow the embedding of insulated layers of transistors and other elements.

In February 1959, Texas Instruments filed a patent and named it the Miniaturised Electronic Circuit. In June of that year, Fairchild Semiconductor lodged its own patent for a similar product that used a different manufacturing process.

So began the original battle of the standards,



i A die shot of a 1971 Intel 4004 processor, which contains 23,000 transistors at 10 microns.



i A die shot of Intel's 486 DX processor.

which even had the obligatory lawsuit for patent infringements. Fairchild Semiconductor eventually won in 1969. Today, most of the industry gives both companies credit for their efforts, with Kilby being acknowledged as producing the first integrated circuit (IC). Noyce gets kudos for improving its design and production techniques, making it workable for use in the real world.

Initially, it was only the military that could see the benefits of such a device. To generate more widespread interest, Kilby was given the challenge of using the technology to design a calculator that was small enough to fit in a pocket, but as powerful as the electro-mechanical desktop devices. These mechanical calculators contained over 1,000 discrete semiconductors and transistors, and cost over \$US2,000. By comparison, the handheld IC-based calculators that Kilby designed (and that were patented by Texas Instruments) required only 90 circuits and were considerably cheaper to produce.

Noyce and Moore went on to create a new business called Integrated Electronics, which was later shortened to Intel. This start-up company leaned on a few friends for money and got itself into the business of producing diodes, transistors, integrated circuits and other integrated electronic structures. The first commercial product from Intel was (and I'm not kidding) the '3101 Schottky bipolar 64-bit static random access memory (SRAM) chip'. Not content with oddly (but descriptively) named products, Intel then went on to develop a logic chip that could be programmed to take instructions. This was known as the '4004 microprocessor' and contained 2,300 transistors.

It was later evolved and became the 8008, which held 3,500 transistors and was twice as powerful as the 4004. Next came the 8080, containing 6,000 transistors, which were used in the first personal computer called the Altair. In 1978, Intel went on to produce the 8085, then the 8086 – sporting an unheard of 29,000 transistors – and promptly flogged it to IBM. In keeping with Moore's law, processors got progressively faster and the number of transistors being used became exponentially higher.

A transistor is, quite simply, an on/off switch. It allows basic binary functions: on=1, off=0. The transistors themselves are solid state; that is, no moving parts. An electric signal defines whether it is on or off. It is the sequence of 1s and 0s, called binary notation, which is used to represent the data.

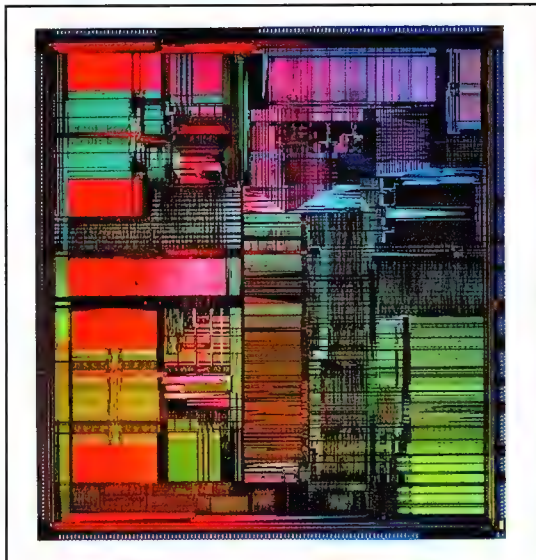
By introducing more transistors, pipelining can be achieved. Pipelining allows the execution of instructions to overlap. For example, one instruction may need ten clock cycles to complete. But by splitting that instruction into ten stages, executed simultaneously, the instruction can be completed in the speed of one clock cycle. Today's processors go a step further and allow more than one instruction to complete simultaneously. This is done through multiple instruction decoders, each with a separate pipeline. The more transistors that are present, the more efficiently this process can take place. It is possible for over 1 billion instructions to be executed in a single second.

Where do CPUs come from?

There are up to 300 steps in the construction of a CPU, so I won't explain them all here. The CPU dies holding these transistors are constructed from purified silicon, which is melted into ingots. Silicon is actually the main component of common beach sand. The ingots are sliced into wafers, which are then buffed and polished to remove any surface imperfections.

The wafer is treated with heat and gases, causing a thin film of silicon dioxide to form on the surface. This is then coated with 'photoresist', a type of liquid plastic. Because of its composition the chemical hardens ▶

① RIGHT: The die of the first Pentium processor, which contains 3.1 million transistors. FAR RIGHT: A fresh wafer of CPUs, ready for dicing and slicing.



when exposed to ultraviolet light. So by focusing ultraviolet light through a lens using a stencil, a circuit pattern is left behind. The unexposed photoresist is washed away. This process is called 'photolithography' or 'deep-ultraviolet lithography'. By using special lenses the wavelength of the ultraviolet light is altered and many more transistors can be etched into the wafer. Currently the wavelength being used is 240 nanometres (nm).

The non-stencilled area of the silicon dioxide is washed away with a chemical treatment and another layer of silicon dioxide is grown over the entire pattern and wafer. This is then coated with polysilicon and then more photoresist.

Using another stencil, ultraviolet light is used to remove more of the dioxide, and the photoresist is washed away again. What is left is the patterned layers of silicon dioxide, separated by layers of polysilicon. The entire wafer is then doped with ions. This allows the silicon to conduct an electric charge. Around 20 layers are built and then etched away, creating intricate patterns and connections between the layers. The openings left behind are coated and filled with metal as more layers are added. Until recently, aluminium was used, but as copper is a better conductor, manufacturers have started using this instead. When this entire process is complete, each die on the wafer is tested, and then using a diamond saw, is cut away from the wafer. Over 100 processor dies can be made from a single wafer. The die is then mounted in a ceramic plate that is wired with thin gold connectors to the pins, which join with the socket or slot on your motherboard.

Technology is now available that allows the construction of microprocessors 100 times more powerful than the fastest you can buy today. Chip makers Intel, AMD, Infineon, Micron and Motorola, as well as the US Department of Energy, are pooling their knowledge and resources to develop a microchip that has circuit lines less than 0.1 microns wide. Compare this with current circuits of around 0.18 microns and you can see the potential.

The current wavelengths of 240 to 193nm are about as fine as existing technologies can provide for. If you start using even shorter wavelengths, the glass lens actually absorbs the light and it doesn't reach the silicon it is supposed to be etching. Now, since the laws of physics determine that smaller wavelengths create finer dots, a better, smaller and more detailed image can be etched. This means you can fit mind-bogglingly large numbers of transistors in a die.

It is possible to manufacture processors small enough to run at 10GHz or higher, but to do this the integrated circuits can't be any bigger than 30nm, as opposed to the current 100nm. The solution is to use mirrors and gas to focus the light.

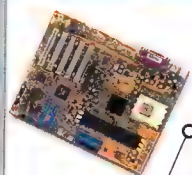
The first full-scale EUV (Extreme Ultra Violet) lithography machine prototype was recently developed. This does some real funky stuff. By directing a 1,700W laser at a xenon gas jet, the gas heats up and 45eV plasma is formed. This plasma radiates light at around 13.4 nanoseconds (ns), which is gathered by a condenser and directed through a stencil. The resulting image is captured by a mirror that has an absorber applied to some parts of it but not others, creating a mask that is reflected across a number of cameras and curved mirrors, bending the image into the shape and size that is transferred to the wafer. The wavelengths of light being used in this process are so small that they could be absorbed by something as thick as air. So the process takes place inside a high-vacuum environmental enclosure. In fact, even the surface of the mirror would absorb them if the mirror wasn't coated in silicon and a metallic element called molybdenum, which has a density of 10.22 grams per cubic centimetre. Despite this, up to 30% of the light is still absorbed by the mirror.

This process is happening now, but some of the barriers to the commercial availability of these CPUs include the costs associated with production and the question of how to adequately cool such a device, as well as the absence of a form factor motherboard and chipset to support these processors. With the competition between AMD, Intel and other chip manufacturers, we should see these in our home PCs sooner rather than later.

In 2000, Kilby was awarded the Nobel Prize for Physics. Drop him a line and thank him for not taking his holidays.

O

You gonna play with this

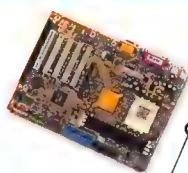


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- **IDE RAID 0 or 1 supported** (optional)
- ATX form factor

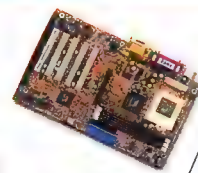


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- ATX form factor



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Server-side vs. client-side gaming

Murray Philbrick rocket-jumps the fence, then back again and finally figures out the fastest way to do it again and again.

As it becomes more apparent that the longevity of a game truly lies in just how long after its launch people still want to use it, catering to the multiplayer crowd is now one of the top priorities when it comes to designing a game. While things such as the recently launched gmax and complex built-in level editors are all fine and dandy, the true measure of just how successful a game will be in terms of its multiplayer longevity relies strongly on its Netcode.

It's for this reason that most companies jealously guard their Netcode, going to great lengths to ensure that its precise workings are at least partially hidden from your average gamer. Even when the code itself is openly available (such as in the various Quake engines), deciphering it can be a difficult task in itself. Most Netcode is written in pure assembly language in order to assist in its computation speed, and even then it adamantly refuses to let mod teams alter it.

The nature of the Net

Of course, there's a lot more to how well a multiplayer game will run over the Net than the Netcode itself. Factors such as the distance from the client to the server, the bandwidth and latency between the two, the number of clients connected, and the power of the systems involved can all have a direct impact on the final gameplay experience.

The term 'Netcode' tends to cover a lot of bases. Things such as packet loss compensation, on-the-fly fixes to player physics, and even things as fundamental as synchronising the actions of players on different computers that have different frame rates all fall under the broad umbrella of Netcode.

However, it's usually the Netcode functions, which more directly affect whether a player wins or loses, that will get players into an uproar. These sorts of functions need to be suitable for the majority of users. In first person shooter terms, this means how the weapons fire and whether or not the hit is determined when a shot is fired.

While a lot of games use multiplayer code, it's probably most advantageous to look at the big two: Quake 3 and Counter-Strike (Half-Life).

Client-side functions

In simple terms a client-side function is a piece of computation that takes place on a client's computer, rather than on the server. With many games, just which functions get calculated client- or server-side can be toggled – that is, you can choose which functions are done by the server and which are done by the client.

The advantages and disadvantages of computing functions client-side are many. The more functions that are done on client computers, for example, the less data load a server has to take. This frees a server's processing power and bandwidth to maintain smoother gameplay (assuming that the client computers are up to their newly assigned tasks).

The trouble with assigning functions to being calculated server-side is that the information then becomes volatile – that is, it can be tampered with on a client's computer in an unfair way. If, for example, it was up to a client to compute and tell a server that it's just hit someone with a head shot, a little tampering could make sure that nearly every shot fired by that client registered as a head shot. Fortunately, most cheats of this nature require a third-party program of some sort running in the background, which makes it easier for them to be detected by anti-cheat programs such as PunkBuster.

Counter-Strike: client-side

In Counter-Strike, many players often notice the inconsistencies that happen onscreen. You fire, your bullet hole hits the wall behind your target, and half-a-second later (and around a corner) your target keels over, dead as a doornail – except the spray of blood appears in front of where the bullet hole was!

This odd kind of behaviour is due to two features of the Counter-Strike Netcode: client-side weapon firing prediction, and server-side hit computation/lag compensation. Both of these functions are, as mentioned, able to be toggled on and off. As they're switched on by default, though, they're certainly worth a look into.

When a client fires a weapon in Counter-Strike, an instantaneous group of effects occur – starting the weapon firing animation, computing muzzle flash, any bullet holes or puffs of dust created by bullet impact in objects. All these actions fall under the 'client-side weapon firing prediction' tag. The functions not relating to what's displayed on the client's screen get passed on to the server – the player's location, facing and bullet paths.

The interesting point to note is that due to client-side weapon firing prediction being turned on, you can fire at a target dead-on and still get a bullet hole in the wall behind them. This is because the client needs to calculate and send the bullet's path data to the server, have it calculated, and then get that data back to the player as a 'hit' or 'miss'. In other words, every shot fired in Counter-Strike is a 'miss' to the client until a server tells it otherwise, but the need for an instant calculation of a bullet

path means that the bullet will always strike the first non-player object it encounters.

Once the server receives data on the client's location, facing and bullet path, the server-side hit computation and lag compensation kicks in. The way this works is that the server receives your firing data, looks at your current ping (say, 360ms), and

other way around, the data between client and server can therefore be tampered with, by using a cheat, to a client's advantage.

Quake 3: server side

Quake 3 and the other Quake games eschew predictive pathing and lag compensation in favour of ►

‘ . . . the server receives your firing data, looks at your current ping (say, 360ms), and then places your bullet path back in the gameworld 360ms ago.’

then places your bullet path back in the gameworld 360ms ago. If the bullet path intersects with where another player was at that point in time, it registers as a hit and gets sent back to the client computers (the person firing, the person being hit, and anyone else affected) where the results of the attack are finally displayed.

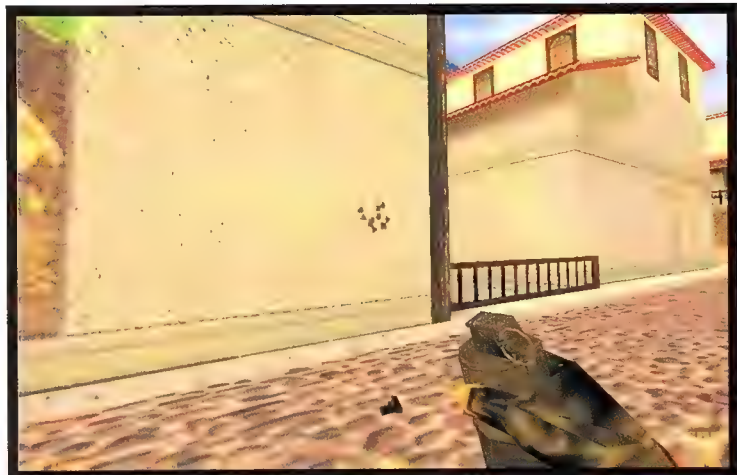
Of course, if your ping is still a constant 360ms, that amount of time will have passed in the game. The game doesn't actually compensate for that time lag, though, which means that if you 'kill' someone and in the following 360ms they turned, fired, had their own data sent to, calculated and received from the server, it's possible for you to die before they do. Interestingly, any graphical effects – such as a spray of blood – will occur at the point of the original bullet path rather than the player model itself.

So with all these zany goings-on, what is the advantage to client-side firing prediction and server-side lag compensation? Simply put, it's that what you see is what you get no matter what connection speed you happen to be at.

If your crosshairs are over your target when you fire, then there's a good (though not 100%) chance that you will hit your target. Given Valve's claim that there is a mere 5% adoption rate of broadband technology among Internet users in the US, it's easy to see why the company is hoping its Netcode will cater to its largest audience – dialup modem users.

There are other factors to client-side prediction. The fact that things such as player facing and location are calculated and sent to the server rather than being sent to the server, calculated and then sent back to the client to be shown on their screen makes for noticeably smoother gameplay, especially for dialup users.

The downside is security. With clients responsible for telling the server where they are rather than the



ⓘ In Counter-Strike the client and server show slightly different bullet strikes.

a more brute force approach. Imagine you're in a game of Quake 3 with a ping of 360ms. You're armed with a railgun and have someone directly under your crosshairs. Left-clicking to fire instantly sends a data signal off to the server that says 'I want to fire'. This reaches the server in 180ms, at which point the server sends back a data string saying 'Be my guest', which takes another 180ms to get back to you. After that 360ms pause your railgun fires and, assuming your target is still under where your crosshairs were when you fired, you hit them.

The downside of this style of Netcode is obvious; people with high pings need to predict, in advance, where their target is going to be when the server finally decides that they've fired.

It can require some impressive leading of targets in order to get anywhere, and gives people with low pings (you know who you are, you bastards) a distinct advantage in that their shots require little (if any) lag compensation on the player's behalf. In addition, the server is constantly updating the client as to its current location or firing state, rather than vice-versa, which can often lead to noticeably increased lag for the unfortunates with slower connections.

So why does it persist with this kind of Netcode? Aside from never being a company to shy away from technological advancement (the adoption of broadband, in this case), the real benefit of server-based calculations lies in its security.

With a server responsible for making all the necessary calculations, nothing can happen without the server's say-so. The cheats that plague games like Counter-Strike, that rely on a client instructing the server about what's going on (headshots, for instance), can't interject between the action of firing and the calculation of what happens with a Quake-like server setup.

In fact, the worst kind of cheating that Quake 3 has thus far experienced is 'proxy' cheating. This involved a client setting up a proxy that, if data saying 'A rocket is coming towards you' passed through it, would send back a signal saying 'My player jumps to avoid it'. This particular method of cheating has since been eradicated, and such cheating problems are few and far between. It makes a nice change considering how rife it is in the Counter-Strike community, where it now seems impossible to find a game that isn't being flooded with calls of 'BS' and 'So-and-so is cheating'.

Client vs. server?

Obviously, which type of server you're going to be playing on is as much a matter of your preference in games as it is your preference in Netcode. With broadband seeing a relatively slow adoption rate (when compared to predictions of growth in the late



'90s), more companies now seem to be moving to even out the playing field for broadband and modem users by using client-side prediction techniques.

In fact, Half-Life started out with Quake 2 legacy Netcode, which favoured the handful of broadband gamers that existed in Australia at the time. The Netcode was later rewritten in anticipation of Team Fortress 2 (it allegedly still exists), shifting it to the modem-friendly client-side prediction, thus magnifying problems with cheating.

Until the problem of data security is remedied, though, there's no clear winner. You'll either have to continue being a Quake-based Nostradamus, or someone who complains about how much better they remember it being in beta because there were no cheats. We can only hope that a solution that combines the best of both worlds can be found in the near future.

i In Q3A, both the server and client show identical bullet strikes.

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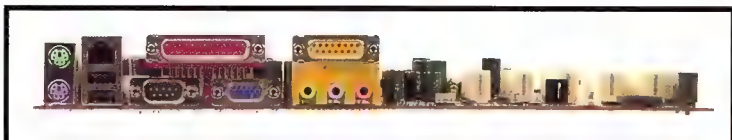
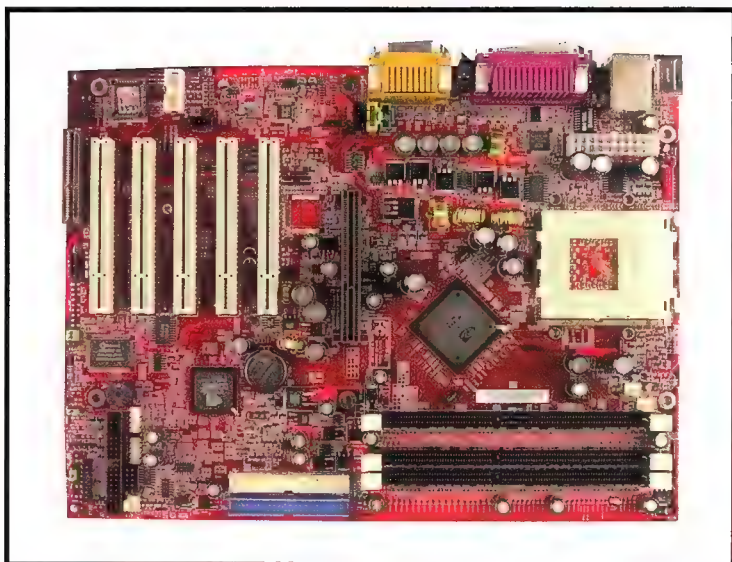
NVIDIA sets its sights on the motherboard and John Gillooly provides some nForce feedback.

If you are anything like the vast majority of hardware nuts, the closest thing to blasphemy is suggesting an integrated motherboard solution. Over the years we have all come to appreciate that the terms 'integrated' and 'onboard' generally mean slow, cheap and sucky.

This is more a side effect of the chipset manufacturer's strategies than a problem with the general concept. Integrated motherboards are used widely by Original Equipment Manufacturers (OEMs) and System Integrators (SIs) to save money when building corporate or 'family' PCs. Generally, they suffer from huge performance hits when using the hardware as well as poor gaming performance and less than stellar sound quality. The main reason for this is cost. Integrated solutions are a good way to reduce the overall cost of a system; however, cutting-edge performance is partially due to the huge amounts of cash that gamers throw at their systems, and cheap almost always means slow.

Enter NVIDIA with its take on the integrated solution. Last year, rumours started emerging that the graphics chipset giant was working on a mainboard chipset. These rumours were bolstered by the news that NVIDIA was not just responsible for developing the graphics hardware for Microsoft's Xbox console, but was doing the sound, networking and various other bits and pieces.

As time progressed, more information filtered out about different variants and, despite the Xbox's use of an Intel processor, the chipset codenamed Crush would be Athlon-only. And the name was to change to 'nForce'. This last move was announced at Computex earlier this year to great fanfare and an avalanche of buzz words. Six months later the nForce has finally hit the market, with NVIDIA claiming it will act to redefine how we think about motherboards.



ⓘ The MSI K7N420 ain't your normal integrated motherboard.

It's core logic, Jim, but not as we know it

NVIDIA is arguably the reigning king of buzz words, and the nForce carries this tradition to new heights. The nForce consists of two major chips: the IGP (Northbridge) and MCP (Southbridge). IGP stands for Integrated Graphics Processor, but this chip contains a lot more than just the graphics processor. There are four major parts: the GeForce2 MX GPU itself, the TwinBank memory controllers, the DASP circuitry and one end of the HyperTransport link to the MCP. The MCP, or Media and Communications Processor, is comprised of the APU (Audio Processing Unit), Stream Thru networking controller, Complete Communications Suite and the other half of the HyperTransport link.

There are actually two main variants of the nForce. The first is known as the nForce420 and uses a variant of the IGP called IGP-128. This means that it sports two 64-bit DDR controllers rather than the single controller in its smaller brother, the IGP-64, which is used in the second variant, the nForce220.

That's a whole lot of fancy words, but they allegedly all make a big impact on how the system performs. The good thing is that the majority of these can be tested. To do so Atomic took an MSI K7N420 Pro nForce420-based board and lined it up against a VIA KT266A-based MSI K7T266 Pro2. The majority of testing was done using an Athlon XP 1600+ (1.4GHz). We used version 1.22 of NVIDIA's unified motherboard drivers (one install file for everything except the GeForce2 – pure heaven) and version 22.50 of the Detonator XP graphics drivers (which were supplied with the motherboard and needed for support of the Integrated version of the GeForce2). For the K7T266 Pro2 we used VIA's 4in1 4.35 drivers. We initially set out to test under Windows Me, but had strange problems crop up. Hopefully, this is just a side effect of early drivers and the early BIOS version of the motherboard. Changing to Windows XP Professional solved these problems, but SYSmark2001 is still incredibly temperamental under Windows XP, which means that we still cannot get reliable results out of the benchmark.

Audio Processing Unit

The first stop on our journey is the Audio Processing Unit of the MCP. This is one of the most hyped (but, strangely, most boringly named) of the nForce's features. This is no tinny little AC-97 sound chip, but an all-singing, all-dancing, fully DirectX 8.0-compliant, Dolby certified sonic weapon – if you believe the white papers. In reality a large number of boards on the market will not actually take advantage of the 5.1 Dolby Digital capabilities of the chipset due to the licensing fees. To keep the cost of the chipset down, NVIDIA has created two variants of the APU. In



ⓘ The nForce MCP-D – this is not a Southbridge, OK?

boards that have Dolby enabled, the chipset name is followed by -D; for example, nForce420-D. There is also a second requirement; that the motherboard comes with a riser card for the 5.1 outputs. Unfortunately, MSI had not yet finalised the card for our K7N420 Pro board, so we were unable to test the surround capabilities.

We did, however, see how much of a hit the CPU took when the APU was in full flight. This was done using Ziff Davis's Media Audio WinBench 99, with the most intensive 32-voice (at 44.1kHz/16 bits) test run in order to see the performance hit delivered by onboard sound (the APU supports up to 64 voices in hardware, but the benchmark only tests up to 32). The difference between the APU and the AC-97 sound used on the K7T266 Pro2 was negligible, with both sound chips delivering a performance hit of around 2%, which is similar to that seen when using a Sound Blaster Live! card.

Stream Thru and HyperTransport

One exciting thing about the nForce is that it revolves around the first implementation of AMD's I/O saviour, HyperTransport. This is used between the IGP and MCP and allegedly delivers a throughput of 800MB/s between the two. This technology allows a freer flow of data than traditional means.

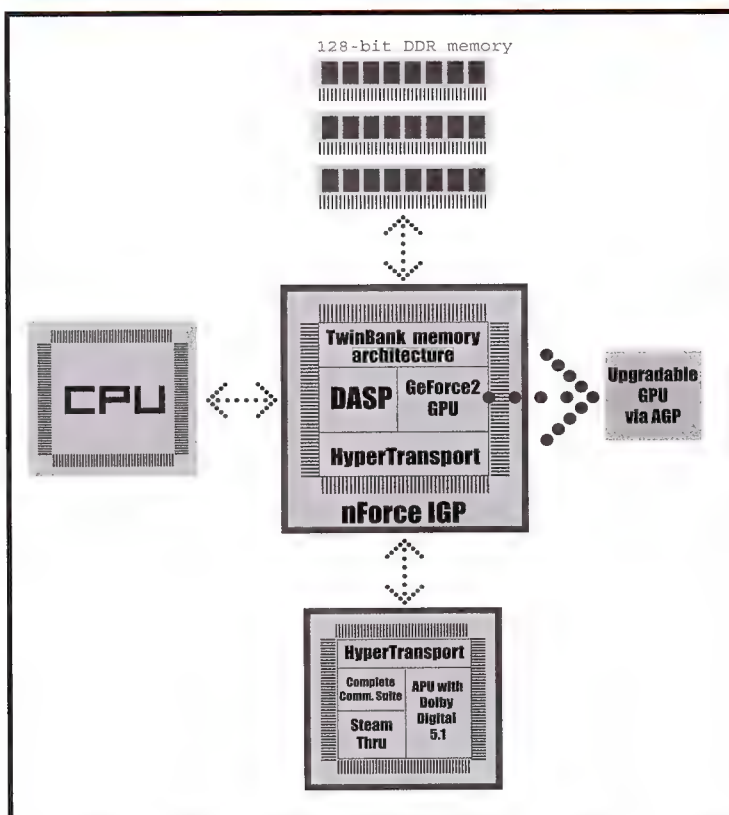
HyperTransport hooks into an internal bus in the MCP. From this internal bus stems the PCI bus, and on a separate branch resides the network controller. By locating it on a separate branch, and supplying it with dedicated isochronous communication with the IGP, NVIDIA alleges it will make the Internet faster, MP3s sound better and your crappy pings disappear forever.

Of course, NVIDIA is not the only one getting onto the HyperTransport bandwagon. Even VIA has released its own new technology, known as V-Link.

Synchronicity

When shifting data around, timing is important. There are three main types of timing methods: synchronous, asynchronous and isochronous. Synchronous refers to the widely used sequential processing, where one process needs to finish before another one can begin. Asynchronous means processes occur independently of each other until there is a need for one to 'interrupt' the other. Isochronous, which NVIDIA has been plugging, falls between the two other types. Referring to processes that are timing dependant, isochronous data is kept flowing at a steady rate, minimising stuttering and choppiness in things like streaming media.

Perhaps the best known implementation of isochronous transport is the bus used in IEEE 1394 (also known as FireWire, i.LINK or S81394), which has been successful due to its suitability for digital video editing and the like.



ⓘ A schematic of how nForce works; all neatly compartmentalised into buzz words.

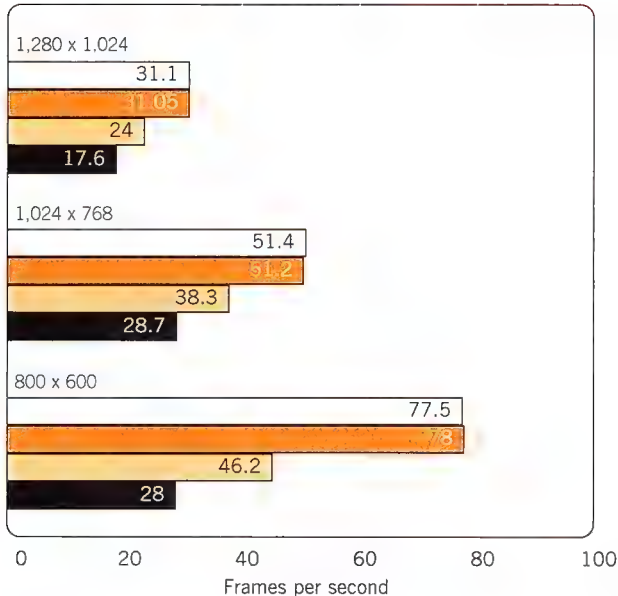
This is purported to deliver 266MB/s of data transport between the Northbridges and Southbridges of the chipset. Theoretically, this means that the nForce will be about three times quicker than the KT266A. But in practice, this is impossible to isolate with our benchmark suite.

DASP

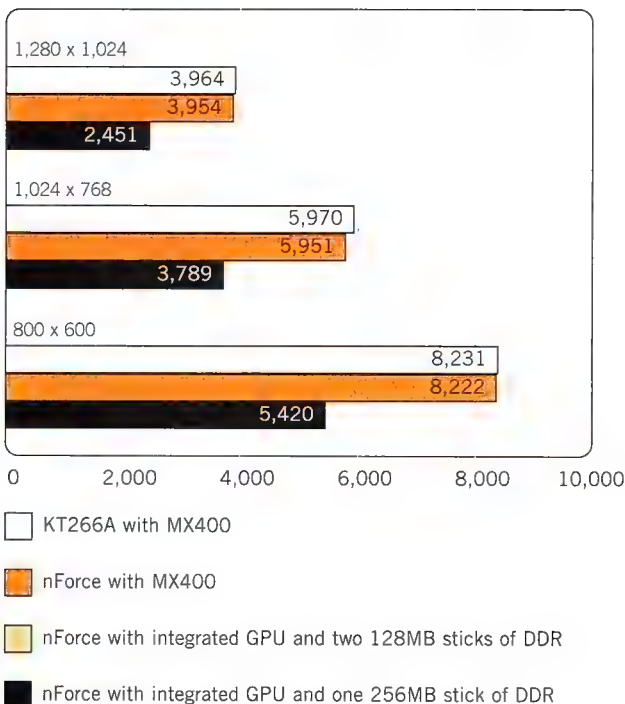
And the prize for the most hard-core name goes to the Dynamic Adaptive Speculative Pre-Processor, or DASP, which is the main reason why NVIDIA says the IGP is more than your average Northbridge. The



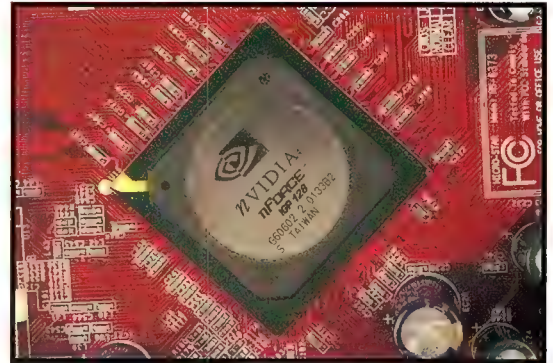
Quake 3: Arena (max.)



3DMark2000 Pro



technology mirrors the data prefetch units used in the Athlon XP and Pentium 4 CPUs. Based around an external cache, it is designed to find patterns in data access. It then works out what comes next and pre-loads it into the cache, thus passing it into the CPU quicker and giving your PC a nice turbo boost.



❗ The IGP is, usually, passively cooled with a heatsink.

Yep, this is an off-CPU replica of something that is included in the latest generation of processors. This is likely to be a by-product of the use of a Pentium III processor in the Xbox. The Pentium III does not have such a unit and neither did the Athlon family when the chipset began development. This is one area where the trusty old Thunderbird-core Athlon will get a big kick along – at least in theory.

GeForce2 MX

Everyone knows that your average integrated graphics hardware would struggle to run Duke Nukem 3D, and that trying to load up something beefy like Black & White would reduce the chip to a smouldering heap. One of the nForce's most exciting features is the integrated GeForce2 MX GPU. This alone should spell the end of mass-market PC's sporting TNT2 Vanta-based graphics cards.

The GPU runs over an internal AGP 8x bus and takes a chunk out of the main memory for its frame buffer. The amount of RAM set aside is adjustable in the BIOS, but only between zero, eight, 16 and 32 megabytes. It is worth keeping this in mind when looking at the nForce, otherwise you may wonder why your 128MB of RAM has changed to 96MB on boot.

Atomic tested the onboard GPU by comparing it to a 64MB GeForce2 MX-400 card running over the external AGP 4x bus. The results are somewhat surprising, but demonstrate one important factor about the IGP architecture.

When compared to the performance under the MX400, the nForce's integrated graphics are disappointing. In Quake 3: Arena the results indicate that performance is being hindered at low resolution by either the CPU or the chipset itself. Even when the graphics hardware seems to take hold (at 1,280 x 1,024), the performance is under half that of the separate MX400 card. With frame rates like this, it is highly unlikely that the nForce could be seen as a performance solution when running under its integrated graphics.

TwinBank

The missing piece in the onboard GeForce2 performance puzzle is related to the two 64-bit DDR controllers that are present on the IGP-128 chip. These controllers feature a technology known as TwinBank. The controllers generally work together, but they are able, when two sticks of RAM are plugged in, to work separately, theoretically doubling the bandwidth available to the chipset. This is important, because it allows the isochronous data from the MCP easier access to the memory and it also frees up bandwidth for the GPU to operate.

It is for this reason why the lower spec nForce220 chipset will be a better mainstream option than the nForce420. For those who want to take advantage of the rest of what the motherboard offers by plugging in their own bleeding-edge graphics hardware, TwinBank will be redundant.

In order to explore the relationship, we compared the integrated graphics performance of the K7N420 Pro when running a single 256MB stick of PC2100 DDR RAM to that of two 128MB sticks of PC2100 DDR RAM. Using Quake 3: Arena we first ran our standard CPU test, which minimises the role of the graphics hardware in rendering the display. The results between the two memory configurations amounted to 3 frames per second (fps). When we cranked the details up to maximum and ran higher resolution tests the gap became much more apparent, indicating the hit placed on the memory subsystem by the GPU.

The performance is still below that of a dedicated MX400 card, but is certainly sufficient for the occasional gaming blast and a damn sight better than the performance delivered by other low-cost chipsets.

nForce vs. KT266A

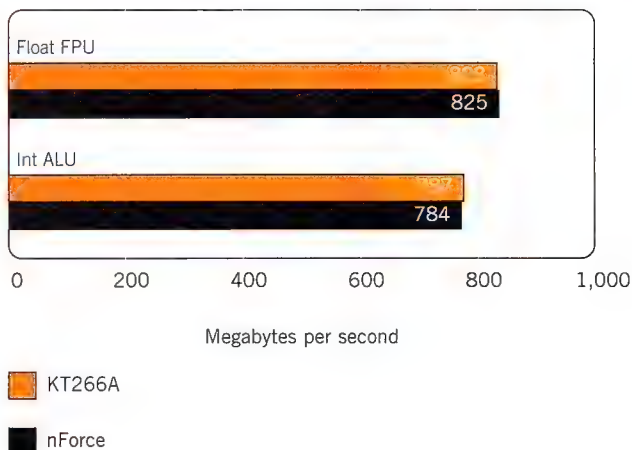
It's easy to say that if the nForce had surfaced soon after Computex it would have been the undisputed DDR performance champion. Unfortunately, it did not manage to surface until just after VIA managed to get its act together to bring out an updated KT266A chipset that moved DDR performance to new heights.

To get an overall idea of how the two chipsets match up, we ran a series of comparisons using Sandra2001, Quake 3: Arena and 3DMark2000 Pro.

If we first look at the Sandra results we can see less than 1% difference between the two chipsets in terms of theoretical bandwidth. If we then compare the nForce Quake 3 results with those of the K7T266 Pro2 we see that there is a remarkable consistency, with both chipsets again staying within 1% of each other. There probably isn't any need to mention that the difference in 3DMark scores is a whopping 1% again.

It is definitely time to rejoice, with this month heralding not one but two fast DDR chipsets to

SiSoftware Sandra2001 memory benchmark



replace the lacklustre chipsets that have plagued us all year. What is even more astonishing is that one of these chipsets is an integrated solution. When the nForce becomes widely available it will come down to a choice between the KT266A and the nForce220 as potential motherboard solutions. If nForce boards appear with decent overclocking options then this will be a very tough decision for consumers. But until then, the KT266A is the more attractive option for the compulsive tweekers among us.

Show of nForce

The nForce shows some of the fastest DDR-based performance we have seen, and combines with tasty features to provide a great Athlon or Duron solution. At an ex-GST price of only \$375 for the MSI K7N420 with all the trimmings – such as TV-out riser card and 5.1 outputs – it is only slightly more than a top-of-the-range KT266A board. The cheaper nForce220 chipset is a great solution for those who have an AGP graphics card. Certainly, the potential is there and only time will tell. The problem is that the core logic market is both new to NVIDIA and highly competitive.

Rumblings have been coming from ATI that it has integrated core logic solutions coming next year. Add to this its licensing of the Pentium 4 bus, support of HyperTransport and its work for Nintendo on the Gamecube, and the eerie parallels with NVIDIA could prove very interesting over the next year. Don't forget that VIA also has the resources of the S3 graphics division, which is currently developing the next-generation Savage for VIA's chipsets. Similarly, SiS has a semi-decent graphics solution in the form of the S315, and it will be the first to market with DDR333 support in its 645 chipset for the Pentium 4. So SiS could well be a dark horse.

NVIDIA has definitely raised the bar for motherboard chipsets, and it will be interesting to see where it goes from here. If the speed of its chipset development proceeds at a similar pace to that of its video hardware, then the potential is astonishing. It is also great to see that chipset manufacturers are looking so closely at the way a motherboard works. With AMD's HyperTransport and Intel's upcoming NGIO3 (Next Generation Input Output 3) PCI replacement sitting alongside DDR333 and AGP 8x, the bandwidth problems of the past should diminish – only to be replaced by more complex bandwidth problems.

Atomic XP presents the Athlon XP

It's finally time to go on the Athlon XPerience. Bennett Ring asks whether this CPU measures up to the 2GHz behemoth that is the Pentium 4.

Let's cut to the chase. AMD has implemented a vague and slightly confusing naming scheme with its new line of Palomino-cored Athlon XP processors. Instead of using the firmly entrenched practice of naming the CPU by its frequency, it has chosen to adopt a 'model number', which it believes is more indicative of the processor's performance. But if you check 'The real deal' on page 38, you'll see that the clock speed of these new CPUs is well below their advertised 'model number' – and a long way from the 2GHz of the latest Pentium 4.

This move has been prompted by the Pentium 4's shattering of ye olde rule 'higher frequencies equal faster processing'. Frequency isn't the only determining factor when it comes to a CPU's ability to get the job done in the fastest possible time. Instructions executed per clock (IPC) is also very important. This term describes how much work the CPU does in each clock cycle. This wasn't as important before the release of the Pentium 4, as both AMD and Intel CPUs had roughly the same IPC. But with the advent of Intel's high gigahertz monster, its IPC took a nosedive.

According to Intel '... [the Pentium 4] design effort focused on delivering an average IPC that was within approximately 10% to 20% of the P6 micro-architecture ...'. This means that for a given clock speed, the Pentium 4 can be up to 20% slower than the previous generation of CPUs – including the Athlon.

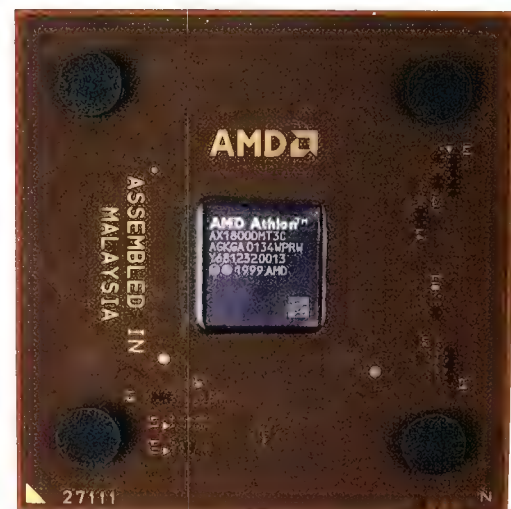
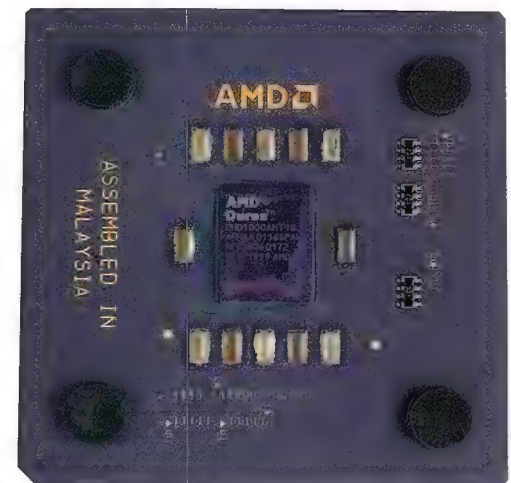
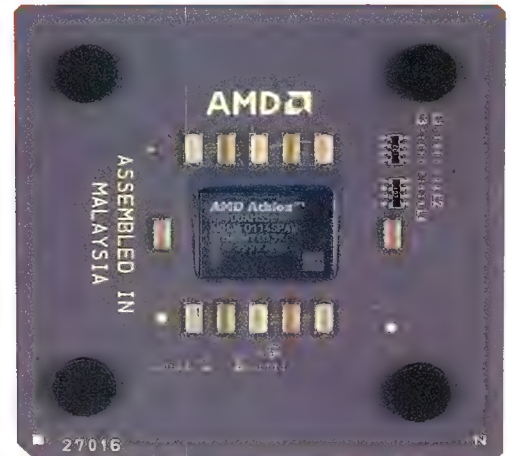
But try telling that to the average user, who for years has had the notion that higher frequencies equal higher performance force-fed to them by funny blue men and, more recently, badly rendered aliens. Intel realised this reliance on clock speed when it came to purchase time, and geared the Pentium 4 towards delivering higher frequencies, albeit at the cost of IPC. Atomic saw the problems this entailed when we conducted our first Head to Head with the Athlon DDR and the Pentium 4 (in issue one of Atomic). In that H2H the lower clocked Athlon severely kicked the butt of the higher speed Pentium 4. But it seems the public has been slow to catch on.

Hence AMD's new naming scheme. The model number of each chip is supposed to represent the relative performance of the Athlon XP when compared to the older Thunderbird Athlon, as well as the Pentium 4. The CPU frequency will no longer be displayed at bootup; it has been replaced by the model number.

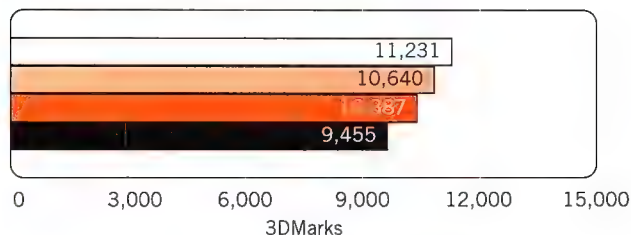
While it would have been preferable for AMD to educate users instead of using this naming scheme, it's understandable considering the resources needed to do so. For a company with limited marketing funds, it's a lot cheaper to simply rename the product than to educate consumers about the intricacies of CPU microarchitecture. But does the Athlon XP perform as well as the model numbers imply?

As for the XP tag, and the claims that this processor is optimised for Windows XP, we've been hard-pressed to find a single bit of truth in this claim. Inquiries to both Microsoft and AMD have met with only the vaguest of explanations, leading us to believe that this claim is 100% bollocks. But as you'll see, we're willing to let this ride ...

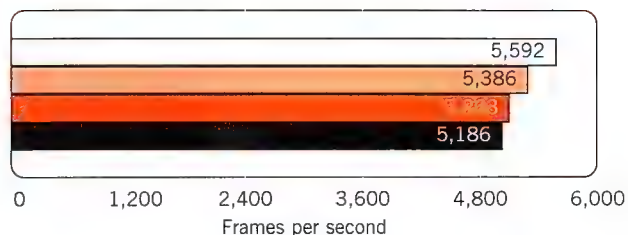
TOP: Note the ceramic packaging, wider core and differing traces on the Thunderbird Athlon. **CENTRE:** The move to the Morgan Duron core saw a shrinkage in core size, but retained the ceramic packaging. **BOTTOM:** And now we have the Athlon XP, with its organic packaging and smaller core size.



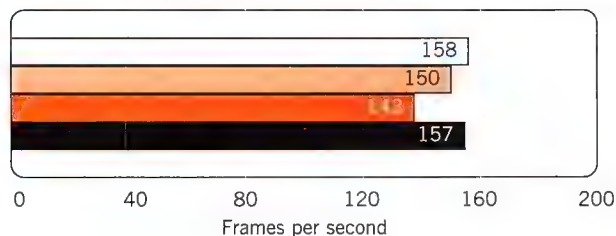
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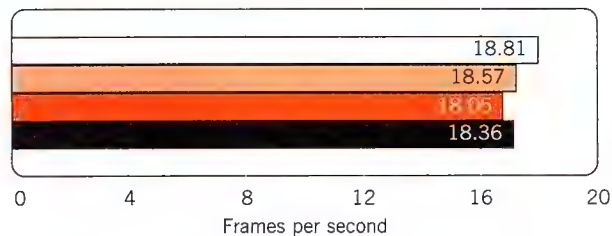
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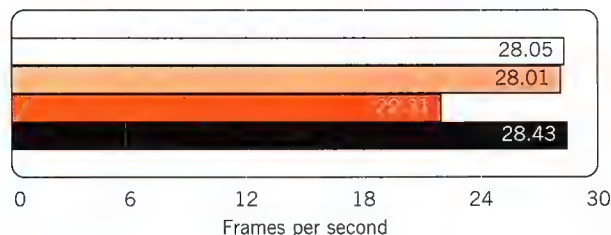
Quake 3: Arena AtomicMPC Demo: CPU test



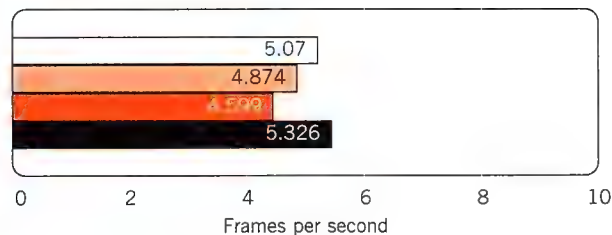
SPECviewperf DRV



SPECviewperf DX



SPECviewperf Light



The new bits

We won't cover the features of the Athlon 4 in depth, as we already did that back in issue 7 when we took a detailed look at the Palomino core. If you've heard of the Athlon XP's QuantiSpeed architecture, don't get too excited. This invention came from AMD's marketing team, not its CPU designers. It simply describes the four features that AMD want to promote about the Athlon XP:

1. The nine-issue, fully pipelined, superscalar microarchitecture
2. The superscalar, fully pipelined floating point unit
3. Hardware data prefetch
4. Its exclusive and speculative Translation Lookaside Buffers (TLB)

These features combine to make the Athlon XP significantly faster than its Thunderbird predecessor, and are also included in the new Morgan-cored Durons. Unlike the Duron, the Athlon XP ships with 128KB of L1 cache and a full 256KB of L2 cache.

One of the most notable features of the Athlon XP is the new OPGA (Organic Pin Grid Array) packaging used – as opposed to the ageing ceramic packaging found in the Thunderbird Athlon – resulting in a lighter and, more importantly, cheaper CPU. Packaging refers to the plate of material the silicon chip is mounted on, which connects to the motherboard. According to AMD, the primary reason for using this packaging is the wider availability of the organic type.

Also noticeable are the factory-locked L1 bridges. All Athlon XP CPUs now ship from the factory in

locked form. The good old pencil trick can no longer be used to reconnect these and thus unlock the CPU's multiplier, as a trench has been laser-etched between the bridges. But if you can fill in those trenches and then reconnect the bridges, multipliers up to 18x become available to play with, which suggests that the ceiling for these chips could be around 2.4GHz. We'll let you know how to unlock these as soon as we get an Athlon XP that we can really play with, but early indications are that conductive ink is the tool for the job.

Even though all of the Athlon XPs now run at a core voltage of 1.75V, their thermal output has decreased significantly over the previous generation of the Athlon. The motherboard we used makes use of the new temperature diode within the Athlon XP, but uses a different method for measuring the temperature of the Thunderbird Athlon. So, unfortunately, we couldn't compare the temperature readings between the two processors. But if AMD is to be believed, the Athlon XP is up to 20% cooler than a similarly clocked Thunderbird Athlon.

The proof is in the pudding

Time for the section you all know and love, where we weed out the wannabes from the can-do's – the mighty benchmarks! We fired up several AMD CPUs on the MSI K7T266 Pro2 motherboard, which uses the awesome VIA KT266A chipset, 256MB of DDR RAM at CAS2, our ▶

'The combination of SSE optimisations and its need for high system bandwidth means the Athlon hasn't been able to keep up with the Pentium 4 – until now, that is.'

reference 32MB Hercules GeForce2 and an IBM ATA-100 Deskstar hard drive. The 2GHz Pentium 4 system used an Intel reference 850 motherboard, 256MB of RDRAM, and the same hard drive and video card as the Athlon system. All systems were running with Windows XP Home Edition (which is the OS AMD is pushing with the Athlon XP), along with the most recent driver sets. As with any CPU review, we were looking at the combined total of memory, motherboard chipset and CPU performance, as it's impossible to use the same motherboard chipset and memory between the AMD and Intel platforms.

The first benchmark to be run was MadOnion's 3DMark2000. We ran this at 640 x 480 resolution at 16-bit colour depth to stop the video card from bottlenecking each system, while all other options were left at the default setting. The Athlon XP 1800+ ran a few rings around the 2GHz, did a little dance, and then kicked the Pentium 4's head in; it scored 19% higher than the P4. Even the Athlon XP 1600+ managed to stick it to the P4, with a 12% higher score.

Next up was the more P4-friendly 3DMark2001 Pro. The Pentium 4 scores relatively better in this benchmark than the older 3DMark2000 Pro, so we were expecting the Pentium 4 to come out ahead of the pack. How wrong we were. Once again the Athlon XP 1800+ beat the 2GHz P4, this time by a more reasonable 8%. Surprisingly, the Athlon XP 1600+ also beat the P4, but by the slightest of margins at 4%.

Quake 3: Arena is *the* benchmark that Intel likes to use when demonstrating the supposed power of the P4 for gaming. The combination of SSE optimisations and its need for high system bandwidth means the Athlon hasn't been able to keep up with the Pentium 4 – until now, that is. We ran our home-grown Q3A demo using the standard CPU settings and, to our amazement, the Athlon XP 1800+ scored a single frame higher than the Pentium 4. While this isn't as impressive as the MadOnion results, it shows that the Athlon XP is at least as fast as the P4 for OpenGL tasks. The Athlon XP 1600+ didn't fare so well, coming out around 5% slower than the 2GHz Pentium 4. But when you consider the 2GHz P4 is about 350% more expensive than the 1600+, this meagre 5% difference fades into irrelevance.

To test 2D applications, we tried to use BAPCo's SYSmark2001. Bad idea. Even though many other sites have managed to run this benchmark while using Windows XP, this benchmark is not compatible with Microsoft's new wonder child. We managed to get it to run on a couple of the systems, but for the majority it simply would not run properly. Makes you wonder about how valid the various online results are, doesn't it?

To round off the benchmarks we used SPECviewperf, one of the industry standards when it comes to measuring professional OpenGL performance. While this is comprised of several different applications, we only used the results from three of the tests within: DRV-07, DX-06 and Light-04. We chose these as they seemed to be the most dependent on the CPU for their results. Luckily for Intel, the Pentium 4 didn't fare quite so badly in these tests. In all three tests, the 2GHz P4 and the Athlon XP 1800+ came neck and neck. Interestingly, the 1.4GHz Athlon XP 1600+ performed substantially better than the 1.4GHz Thunderbird Athlon, showing clearly the performance improvements that the new Palomino core offers.

Thank you, AMD

What makes the performance figures even more incredible is the cost of the Athlon XP when compared to the Pentium 4. The 1800+ part is now retailing for around \$500, while the cheapest 2GHz Pentium 4 is \$1,200. Add the high price of RDRAM compared to DDR RAM, and only uninformed buyers would ever choose a Pentium 4 over the Athlon XP.

When we consider that the 1600+ sells for *one third* of the cost of the 2GHz P4, and manages to keep up with it for most tasks, we can almost forgive AMD for its model number scheme. In fact, this scheme seems conservative, with the 1800+ thoroughly trouncing the 2GHz P4 in the majority of benchmarks.

We can't wait to see what the Athlon XP is capable of once we've managed to unlock the multiplier, but initial reports show an average overclock of the 1800+ to around 1.8GHz. At this kind of speed, Intel should be reconsidering the direction it wants to take with the Pentium 4. But even at its default speeds, the Athlon XP is quite simply the fastest CPU available to PC users, at an amazingly low price. □

Trench warfare

As these shots show, the Athlon XP's L1 traces haven't just been severed with a laser cut. Now there is an actual trench between the traces, which prevents the famous pencil trick from being used to unlock the multiplier.

But where there's a will, there's a way... and it seems to be via the use of a rear window defogging repair kit or conductive ink. We'll keep you posted.



The real deal

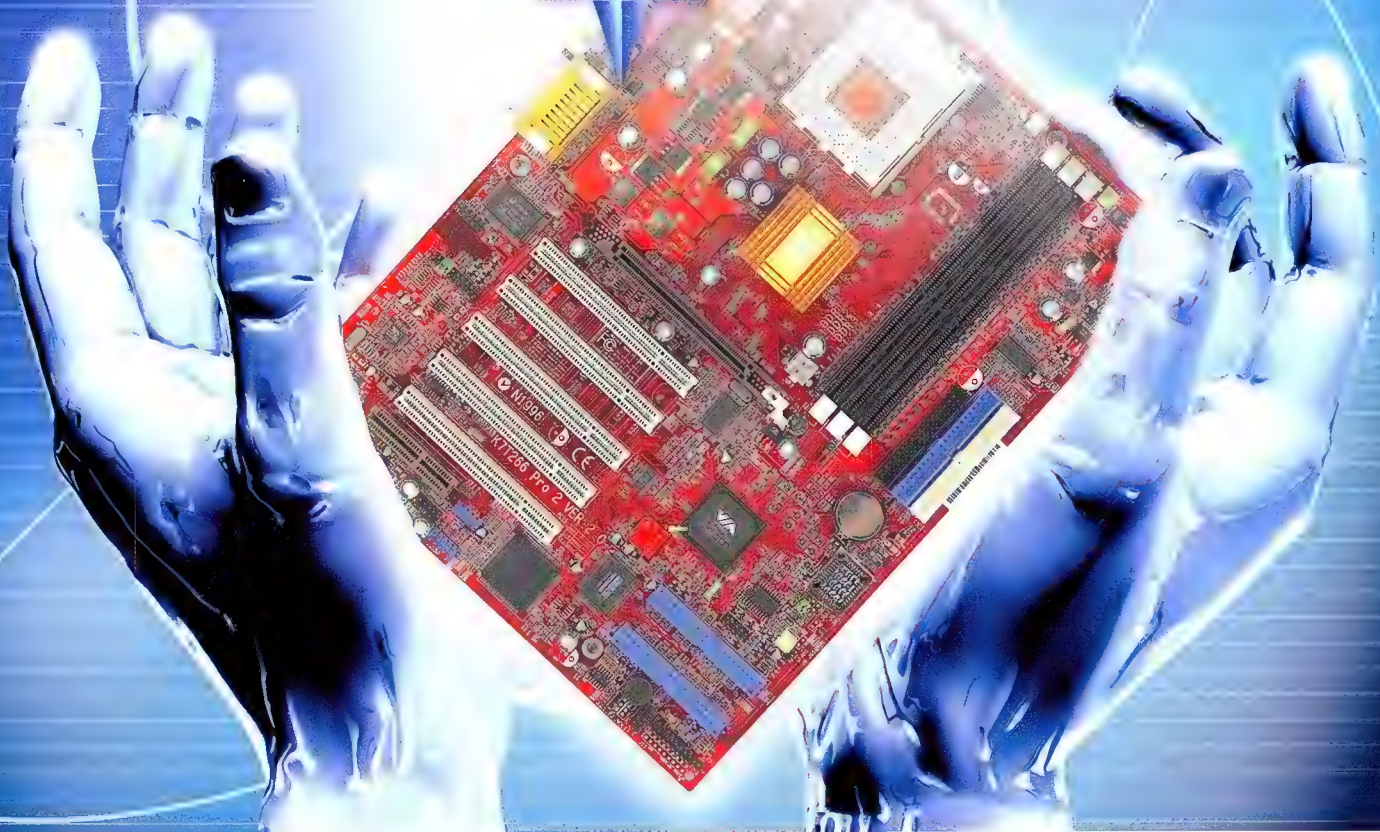
AMD is trying to stop the public from discovering the true speed of the Athlon XP processors, but this information is surprisingly easy to come by. Here are the true speeds:

1800+ = 1.536GHz

1700+ = 1.476GHz

1600+ = 1.4GHz

1500+ = 1.336GHz



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REVIEWS



The truth is out there

When it comes to benchmarking, there are several things that manufacturers can do to gain the lead. Bennett Ring asks if it's fair.



Unless your phone or cable lines have been severed in the last couple of weeks by a blithering Chinese fishing trawler that happened to be cruising down your street, you would have noticed that there has been a spot of controversy on the Net about a certain set of drivers for ATI's flagship product, the Radeon 8500. It seems the buffs at HardOCP (www.hardocp.com) discovered that these drivers were specifically optimised to perform well in Quake 3: Arena. Since this discovery, every man and his Web publishing dog have pounced on this revelation, and in most cases have pointed the finger of shame at ATI for releasing said drivers.

It appears that these drivers boost frame rates at the expense of visual quality, but only in Quake 3: Arena. It isn't a severe decrease in image quality; in fact, most people probably wouldn't have noticed it considering that the Quake 3 characters run around at roughly 300km/h. If you're the kind of person that likes to stand staring at a wall while rockets and shotgun pellets fly by, not only are you pretty strange, but it's doubtful that the difference would have stood out even then.

The problem lies in the fact that ATI didn't make it clear to reviewers that the drivers were optimised in this way, as well as the fact that they only enhance performance for perhaps the most widely used gaming benchmark in the world (don't tell the chaps at MadOnion I said that!). In a world of reviews where benchmarks are the basis for opinion, the act of optimising drivers for a specific benchmark could be interpreted as slightly less than honourable. But are these drivers really that unforgivable in this world of excessive PR bullshit and wildly over-inflated technical claims?

We have to remember that ATI isn't the first to be guilty of using texture compression within its driver sets to increase performance. If you can remember way back to the release of NVIDIA's Detonator 5.xx drivers, you'd remember that these also forced texture compression to speed things up. The difference is that NVIDIA told people about this

change, and that the compression wasn't targeted at a specific game or benchmark – it actually affected *all* programs. If ATI had been forthcoming with information regarding these Quake optimisations, there wouldn't have been a problem. But the IT press, being the pedantic reputation-destroying beast that it is, likes to latch onto even the merest hint of controversy in an otherwise drama-free realm.

Here at Atomic we haven't been so quick to judge. We chose not to use these drivers for our benchmarking of the Radeon 8500, as we wanted a truly apples-to-apples comparison between it and the GeForce3 Ti 500. But that doesn't mean we are totally against them. If these drivers offer better performance to the 12 people in Australia who still play Quake 3: Arena, at the cost of a negligible decrease in image quality, then more power to ATI for being able to do so. It would have been ideal if these optimisations extended to all games that use the Quake 3 engine, especially with several upcoming games being based on this engine, but only time will tell whether or not ATI will implement this. As someone who values super-smooth frame rates above all else, I'm hoping it will. You can at least be sure that the company will tell us about it if it does.

On an unrelated note, I have to say that things have been hotting up in the Atomic offices over the last month or so. As we enter the Christmas season we're being spoilt for choice when it comes to high-end motherboard and graphics chipsets. Not to mention the two new hyper consoles that are due for imminent release, as well as new CPUs from AMD and Intel. It's like being a kid in a candy store with mummy's American Express Platinum card. After hearing initial reports that Halo on Xbox is 'the finest first person shooter ever', I have to admit that I'm a little worried that the Xbox could damage the PC's reputation as the only platform for the serious gamer. But, thankfully, the lack of multiplayer support should ensure this nightmarish scenario only manifests itself in my darkest dreams.

It looks as if the Gamecube might just be the surprise victor of the console war come this time next year. There has been surprisingly little hype about this console, or maybe that's just because its advertising has been dwarfed by Microsoft's \$500 million Xbox campaign. Regardless of the lack of hype, some of the upcoming Gamecube titles leave anything you've ever seen in the dust. Most notable is the sequel to Rogue Squadron, Rogue Leader. The models seriously look as if they've been ripped straight from the movies, which shows that the Gamecube has enough grunt under the hood to take on the PS2 and Xbox.

On a final note, have yourselves a Merry Christmas, and may your chrissy stockings be jam-packed with the latest PC booty that your relties can afford.



Atomic benchmarks

Take a look inside the Atomic Labs testing procedures.

Here at Atomic it is our primary intention to give you the final word on the latest in hardware and PC technology. An integral part of determining the performance of a particular piece of hardware is benchmarking, and this is something we take very seriously in the Atomic Labs.

SYSMark2001

SYSMark is a product of the collaboration between industry group BAPCO (www.bapco.com) and MadOnion (www.madonion.com). It is the first of the next-generation application benchmarks and is designed to more accurately replicate the day-to-day workload that a system is subjected to. The benchmark focuses on Internet content creation and office productivity tasks in order to generate a final rating.

SiSoftware Sandra 2001 Professional

Sandra, from SiSoftware (www.sisoftware.co.uk), is a comprehensive benchmark and diagnostics utility. It contains dozens of special module applets that retrieve detailed information about the specifications and settings of a system, by polling each component's built-in firmware or BIOS. Sandra also features a small suite of synthetic benchmarks for specific components such as CPU, memory, CD-ROM and hard disk. It also features a burn-in wizard for stress-testing overclocked systems.

3DMark2000 Pro

3DMark2000 Pro from MadOnion (www.madonion.com) is a powerful benchmark for testing Direct3D performance, and is the successor to the popular 3DMark99 MAX. Although it is a synthetic benchmark, it uses the advanced MAX-FX 3D engine from Max Payne, which is representative of the latest in Direct3D performance and technology.

3DMark2001 Pro

3DMark2001 Pro from MadOnion is the next progression of the popular benchmark. It also uses the MAX-FX engine and heavily emphasises

DirectX 8.0 functions, including programmable shaders. The results are not comparable with results from 3DMark2000 Pro.

Video2000

Video2000 is another MadOnion product designed to test video card performance. It doesn't measure 3D performance, but instead focuses on visual quality and video decoding performance.

Quake 3: Arena AtomicMPC Demo

Quake 3: Arena (Q3A), from id Software, is the very popular first person shooter representing the latest in OpenGL gaming technology. Q3A has a built-in benchmarking utility and built-in demos that can test graphics card performance. These demos are fairly simplistic, and are not representative of the worst conditions that the game can offer to a graphics card. So we developed our own AtomicMPC Demo that pushes the hardware as far as possible.

Other benchmarks

Sometimes we need to break down the tests into more specific areas, such as hard disk performance, or a particular facet of 3D like T&L or SSE. For these specific purposes we can draw on a vast number of applications, games and dedicated benchmarks such as CD Speed 99, DisplayMate, Evolve, MDK2, Adaptec ThreadMark, Aquamark or Serious Sam. Whenever we use one of these special benchmarks we will outline the nature of the tests, the testing procedures and any settings we use. □

atomic testbench specs

There are two testbenches in the Labs: one for running AMD processors and one for Intel processors. Both run Windows Me, DirectX 8.0a or DirectX 8.0, LiveWare 3.0 for Windows Me, and Detonator XP 21.83 drivers.

- AMD Athlon Thunderbird 1GHz system - ASUS A7V133 motherboard
- Intel Pentium III 1GHz system - ASUS CUSL2 motherboard (Both systems supplied by CASSA, www.cassa.com.au)
- Intel Pentium 4 system - ABIT TH7-RAID motherboard (Supplied by ABIT, www.abit.com.tw)

Common components

- Transcend 128MB PC133 CL2 SDRAM (Supplied by CASSA)
- Transcend 128MB PC2100 DDR RAM (Supplied by CASSA)
- Samsung 256MB PC800 RDRAM (Supplied by CASSA)
- 20GB Ultra DMA/100 7,200rpm hard disk drive
- Hercules Prophet II GTS 32MB (Supplied by Guillemot, www.hercules.com)
- Sound Blaster Live! Player (Supplied by Creative Labs Australia, www.creative.com)
- ASUS 12x DVD-ROM drive (Supplied by CASSA)
- Floppy disk drive

Benchmark settings

3DMark2000 Pro

- 1,024 x 768, 16-bit colour, 16-bit textures, 16-bit Z-buffer, triple frame buffer
- 1,024 x 768, 32-bit colour, 32-bit textures, 24-bit Z-buffer, triple frame buffer
- 1,600 x 1,200, 16-bit colour, 16-bit textures, 16-bit Z-buffer, triple frame buffer
- 1,600 x 1,200, 32-bit colour, 32-bit textures, 24-bit Z-buffer, triple frame buffer

Quake 3: Arena AtomicMPC Demo

All tests use Quake 3 1.27g

- CPU: 320 x 240, maximum geometry detail, minimum graphics settings, high sound quality
- Graphics cards: 640 x 480, normal quality graphics settings, high sound quality
- 1,024 x 768, maximum graphics settings, high sound quality
- 1,600 x 1,200, maximum graphics settings, high sound quality

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CRX1600LEK

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orientation
- Performance Plug-N-Play
compatible iLink Interface
- Large 4MB Buffer



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40X Playback
- Internal model designed for
desktop & tower PCs
- High Quality Optics
- Fast Digital Audio Extraction
- Operates in vertical or horizontal
orientation
- Compatible with all main CD
formats and writing methods
- Buffer-under-run protection



CRX175MC1

- 24X Writing, 10X Rewriting
40X Playback
- Internal model designed for desktop
& tower PCs
- High Quality Optics
- Fast Digital Audio Extraction
- Operates in vertical or horizontal
orientation
- Unique Memory Stick operation
- Latest Sony Buffer-under-run
technology



Also known as IEEE1394, this super-high performance interface offers transfer rates up to 400Mb/s. This exceptional speed makes it great for time sensitive audio and video recordings. With Plug-N-Play operation, it's great for laptops or a shared office environment.

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Developed by Sony, this technology ensures high fidelity recording and consistent maximum performance. While preventing buffer-under-run, PowerBurn™ optimises the drive operation to make the best use of the PC, media and environmental conditions.



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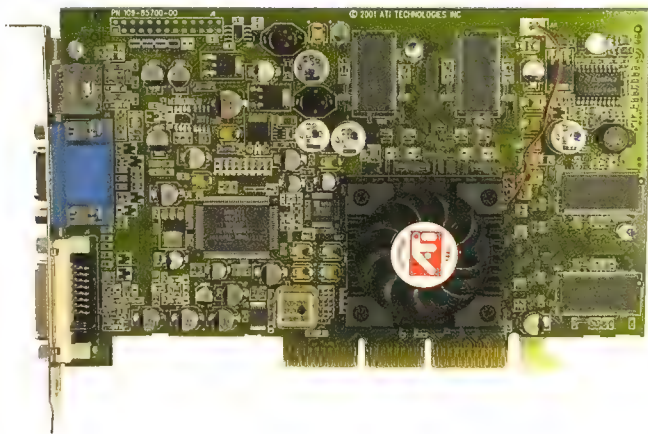


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ATI Radeon 8500

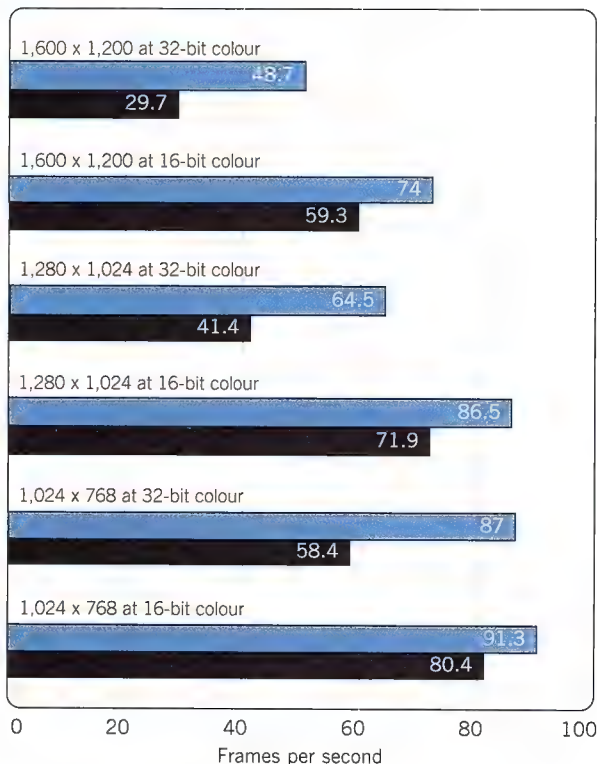
On paper, it outshines all in its class. Bennett Ring finds out if there is gold beneath the glitter.



The original Radeon floundered onto the PC scene like a goldfish tossed out of its bowl, due to a combination of average performance levels, shoddy driver support and uncompetitive pricing. However, what stood out about ATI's card was the richness of the colours it displayed as well as the overall crispness on the desktop. 'If only you ran games at twice that speed, damn you! And stop bloody crashing!' was a common lament for those who unwisely purchased this first generation of unproven technology.

But time heals all wounds, and also tends to lead to new

Serious Sam



developments in hardware. So it was with great excitement that we took the opportunity to strap the new Radeon 8500 into our rack of PC torture.

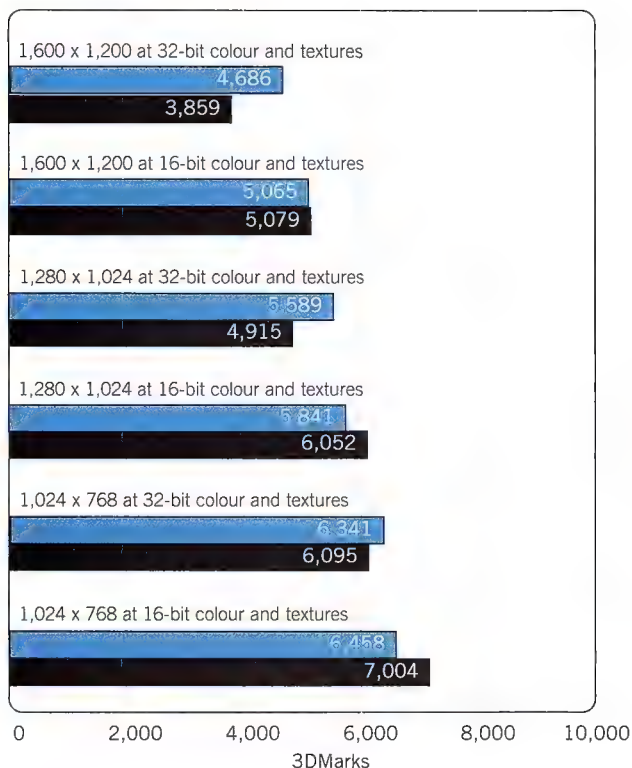
The Radeon 8500 is chock-full of goodies; it packs 60 million transistors and four rendering pipelines onto the one chip, and uses a 0.15-micron process. So in terms of technical complexity, the 8500 is up there with the GeForce3. It's also fully DirectX 8.1 compliant with a second-generation hardware T&L engine, known as the cutesy Charisma Engine II, which might prove useful when more than six games are available that make use of these features. Likewise, the Vertex and Pixel Shaders, which exceed those of the GeForce3 in terms of power to developers, will no doubt come in handy when Doom 3 is released sometime around 2008. A 400MHz RAMDAC ensures a crystal-clear display, while HYPER Z II technology helps to alleviate the increasingly troublesome problem of overdraw through some handiwork with the Z-buffer.

Full Scene Anti-Aliasing is also catered for, but most curious of all is the TRUFORM feature, which enhances supported games by creating more triangle-rich models on the fly. Counter-Strike is one of the few games that currently supports this easily implemented feature. The effect is impressive and leads to less angular, more realistic player models. Some impressive video de-interlacing features are rounded out by a huge memory bandwidth of 8.8GB/s. This is supplied courtesy of the 64MB of 128-bit DDR running at 275MHz, and ATI claims that it has an even more impressive effective memory bandwidth of 12GB/s due to HYPER Z II. Compared to the memory bandwidth of the GeForce3 Ti 500 at 8GB/s, on paper it looks as if the 8500 has what it takes to pull away from the GeForce3 at higher resolutions. Dual monitor support is the icing on the cake.

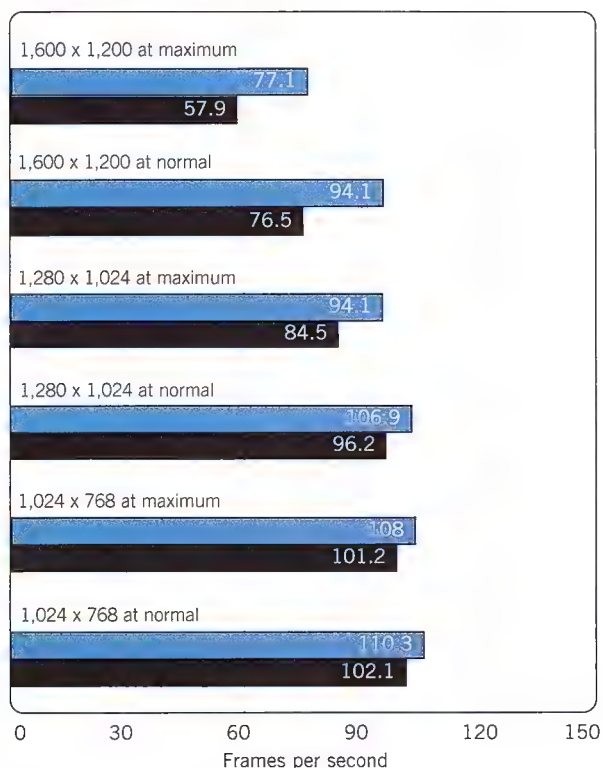
For the purposes of our benchmarks, we installed the 8500 into an MSI K7T266A Pro2 motherboard with a 1.2GHz Athlon, 256MB of DDR RAM and our regulation testbench drives. No sound card was installed during the test, so we couldn't hear the 8500 scream as it ran the Nature test at 1,600 x 1,200 at 32-bit colour for the thousandth time. A GeForce3 Ti 500 was also used as a comparison to the 8500. ATI doesn't have the best reputation for driver support, so we stuck to Windows Me rather than XP, as this is the more mature driver set.



There has been quite a bit of controversy regarding the drivers that ATI has released for the 8500; specifically, an unsupported set that affects Quake 3 performance. It appears that these drivers are optimised to compress the textures within Quake 3: Arena – the number one OpenGL gaming benchmark in the world – leading to a 10 to 15% increase in performance at the cost of a slight loss in image quality. If ATI had made it clear that these drivers boosted frame rates while making things slightly less legible, we're sure there wouldn't have been a problem. But it didn't and now the Net's various high-profile tech sites have jumped on this like a drug-sniffing dog mounting a bag of Columbian coke. To be fair to ATI, it isn't the first company to resort to such tactics, but NVIDIA managed to get away with it. To steer clear of this controversy, Atomic tested with the latest official drivers for the 8500, the 4.13.7191 set. To our knowledge, this set does not alter image quality.

3DMark2001 Pro



Quake 3: Arena



 GeForce3 Ti 500
 Radeon 8500

The first benchmark to hit the 8500 was the DirectX 8.0 benchmark, 3Dmark2001. What better test for a DirectX 8.0 video card? As the results show, from 1,024 x 768 up to 1,280 x 1,024, the Radeon 8500 lays the smackdown on the GeForce3. The 8500 especially flew at the lowest resolution, with a 9% lead over the GeForce3. However, at 1,280 x 1,024 using 32-bit colours and textures, the GeForce3 regained the lead, with an increase of 21% at the highest resolution of 1,600 x 1,200 with 32-bit colours and textures. So it looks as if the Radeon 8500 has what it takes to keep up with the GeForce3 until it starts reaching higher resolutions. This is surprising considering the hardware should be capable of better results, but we're guessing it's a problem with the drivers.

Next up was the old OpenGL stalwart, Quake 3: Arena. The 8500 was beaten across the board by the GeForce3 – but only by a margin of around 10% – until we reach a resolution of 1,600 x 1,200, where the GeForce3 again pulls away to a 33% lead. However, if we had used the 'special' ATI drivers, the 8500 would have had a slight lead except at the top resolution. So it's quite probable that future driver releases will narrow this gap even more.

The final benchmark was Serious Sam, chosen for its OpenGL basis. The Radeon performed most poorly in this benchmark; it was around 13% slower at the lower resolutions and an astounding 64% slower at the highest resolutions. To close this gap, ATI is going to have to do some major tweaking

to its drivers. But it seems unlikely that this will be enough to bring it up to the speed of the GeForce3.

In summary, the Radeon 8500 is an impressive piece of hardware. It doesn't seem to be quite as speedy as the GeForce3 Ti 500, especially at the highest resolutions, but it isn't far off. The inclusion of TRUFORM, as well as the beautiful quality of the display and the digital video features might be enough for many to ignore this slight performance gap.

ATI must be commended for being the first company to release a product that can stand up to the might of NVIDIA's beastly GeForce range. It can only be a good thing for consumers that NVIDIA's monopoly of the gaming graphics card market is now in doubt. And with further refinements to ATI's immature drivers, things can only get better for the Radeon 8500 card.

SPECIFICATIONS

64MB DDR RAM, four rendering pipelines, Vertex/Pixel Shaders, HydraVision dual monitor support

Web site: ATI www.ati.com

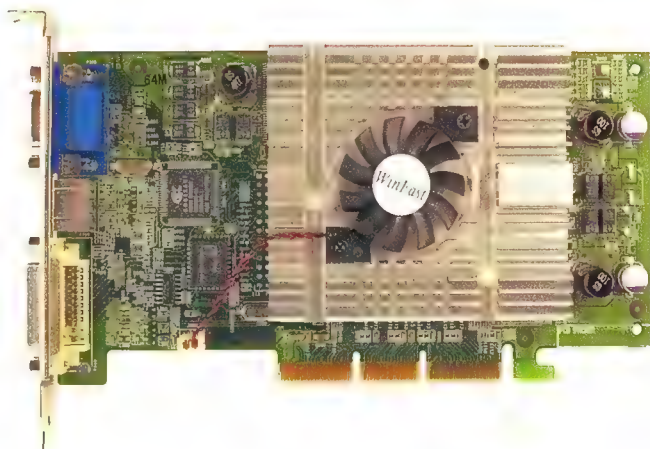
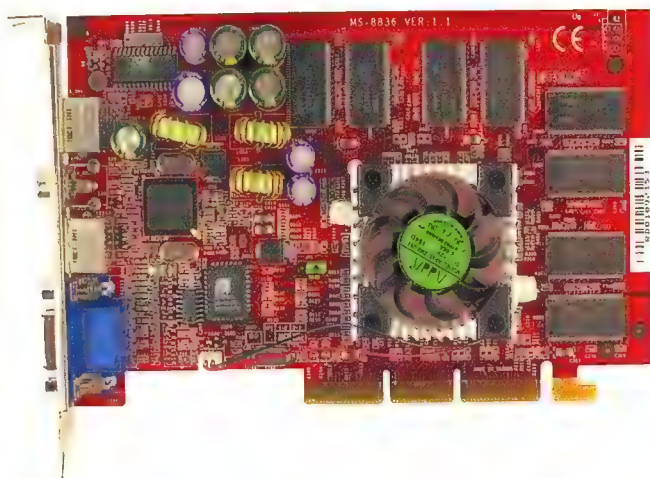
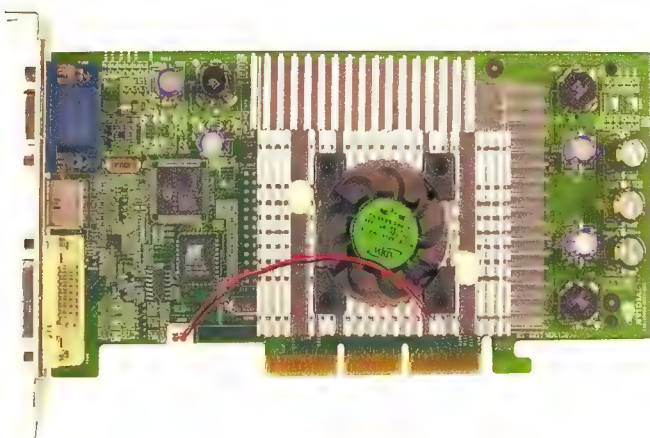
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GeForce Titanium Series

With Platinum done to death, John Gillooly tries some Titanium



Here we go again. Another Christmas and surprise, surprise – another 'Ultra' card from NVIDIA. After spending a whole year sitting at the top of the graphics card heap the competition is beginning to catch up and NVIDIA feels a special need to entrench itself even further into the gaming mindset.

The tack NVIDIA has taken is to re-release the GeForce2 core in two brand-new variants, while giving the GeForce2 a bit of a spit-shine at the same time. The new line of cards bear the moniker of 'Titanium', which means absolutely nothing, but is actually a shiny metal used in military hardware and cutting-edge gadgets the word does at least sound cool. In fact the amount of titanium in these cards is directly proportional to the ability of the GeForce series to actually manipulate the laws of gravity.

The GeForce2 Titanium is designed to replace the mishmash of GeForce2 GTS, Pro and Ultra cards that are still on the market, essentially refining the GeForce2 line-up into the mid-range Titanium and the budget MX200 and MX400 cards. What all this means is that the GeForce2 Titanium is little more than another speed adjustment in this venerable video chipset.

On the other hand, the GeForce3 Titaniums are designed to replace the original GeForce3 and centre around a slightly revised core. This new core adds Shadow Buffers to the card, which will probably take even longer to be adopted than the other DirectX 8.0 features that are already present in the core. Add some speed adjustments and you have the new diversified GeForce3 range.

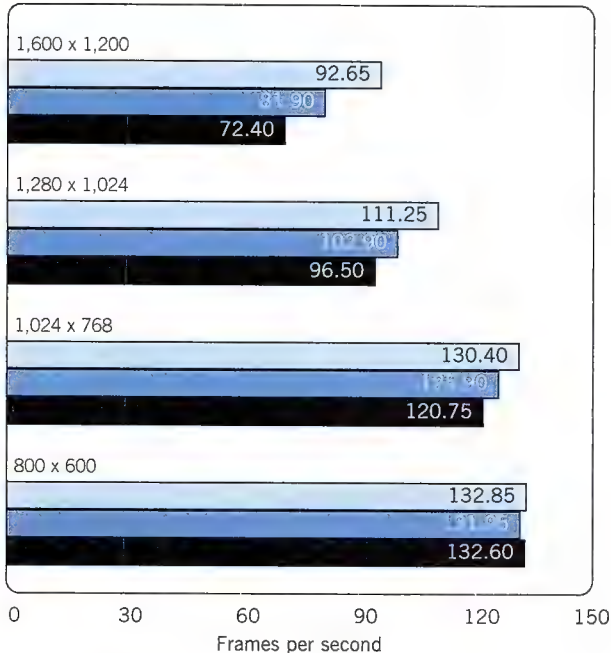
There are two models of GeForce3 Titanium: the GeForce3 Ti 200 and GeForce3 Ti 500. The numbering seems to refer in an oblique way to memory speed. The Ti 500 sports DDR memory running at an effective speed of 500MHz, while the Ti 200's memory bus runs at 200MHz, which translates to an effective DDR speed of 400MHz. For all intents and purposes, it is worth looking at the Ti 500 as the GeForce3 Ultra, and the Ti 200 as the mainstream GeForce3 card.

The core used on the GeForce3 Ti cards sports one advertised change from the original GeForce3; namely, the addition of Shadow Buffers. These allow the creation of more complex shadows within a scene and have been available in professional hardware for some time now. The harsh reality is that it's unlikely that games supporting this technology in any meaningful way will appear in the near future. We are still waiting for games that take full advantage of the programmable shaders that are the main feature of the GeForce3, so it is unlikely that any newer features will be incorporated into games – a problem also faced by ATI with the special features on the Radeon 8500.

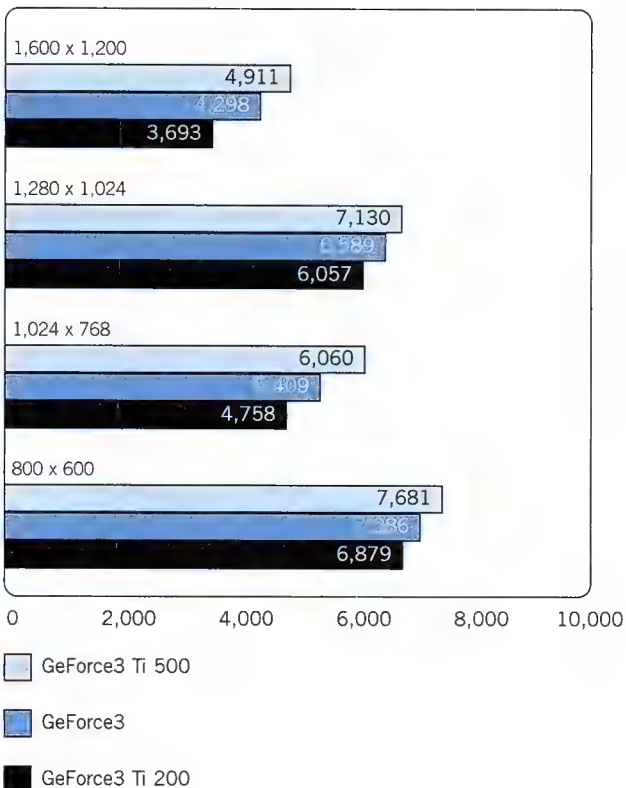
To demonstrate where these new cards fit in the NVIDIA line-up, Atomic tested them against their predecessors. Using MSI's GeForce2 Ti Pro-VT and GeForce3 Ti 200 Pro-TD, with Leadtek's WinFast Titanium 500 TD, we stacked them up against a 64MB Hercules GeForce2 GTS and a 3DPower Morpheus GeForce3. The cards were all tested on a MSI K7T266 Pro2 motherboard, with an Athlon XP 1600+ and 256MB of DDR RAM. We tested with Quake 3: Arena,

① TOP: GeForce2 Ti Pro-VT CENTRE: GeForce3 Ti 200 Pro-TD BOTTOM: WinFast Titanium 500

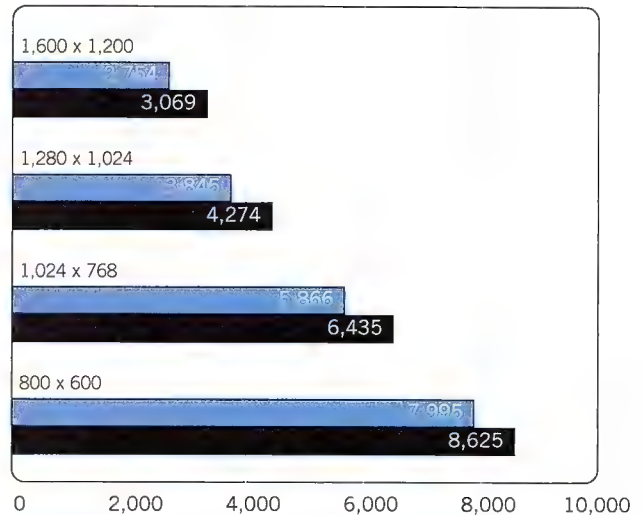
Quake 3: Arena



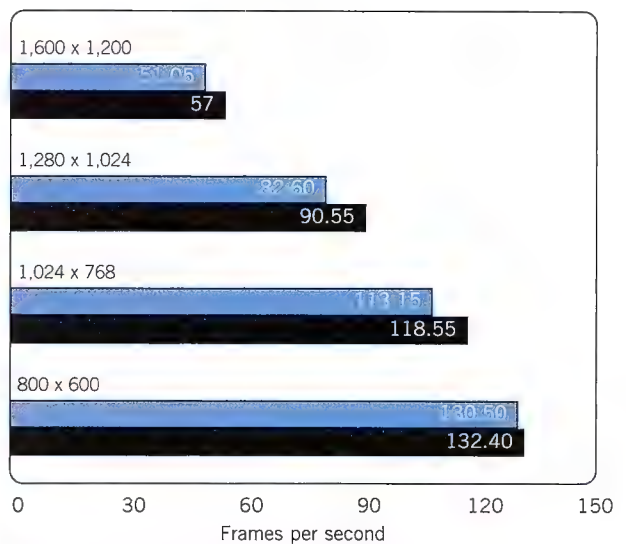
3DMark2001 Pro



3DMark2000 Pro



Quake 3: Arena (max.)



GeForce2 GTS

GeForce2 Ti

3DMark2001 Pro and 3DMark2000 Pro.

The difference between the GeForce2 GTS and the GeForce2 Ti averages 10%, with the gap widening slightly as resolutions increase, thanks to the increased clock speeds. When compared to the GeForce3 Ti 200 the GeForce2 Ti's respectable performance pales, with the gap starting out at 10% at low resolutions and blowing out to 45% at 1,600 x 1,200. That said, the GeForce2 Ti still represents excellent

'... balancing antialiasing with anisotropic filtering is a difficult task, but with the insane levels of performance at high resolution there are strong arguments against a need for antialiasing at those resolutions.'

performance at a reasonable price.

When it comes to the GeForce3 Ti cards, the performance difference between the Ti 200 and the Ti 500 starts out around 10% at low resolutions and leaps to almost 30% at 1,600 x 1,200. Either way, both cards manage to deliver ridiculous frame rates in all the tests. This trend continues all the way up to 1,600 x 1,200, where the Ti 500 delivers just under 93 frames per second (fps) in Quake 3, with maximum detail. The graph results also provide a good picture of how the new series relates to the original GeForce3 (which should still be available at a very attractive price as manufacturers shift to the newer products).

With all these spare frames, the big issue is what you can do with them. The answer is to trade them in for antialiasing or anisotropic filtering. Rather than revisit the performance hits under Quincunx, we tested the Ti 500 under differing levels of anisotropic filtering. To unlock the full range of options, the latest version of NVMax – which you can find on the Atomic CD or at www.nvmax.com – was used. The card was tested using 16-, 32-

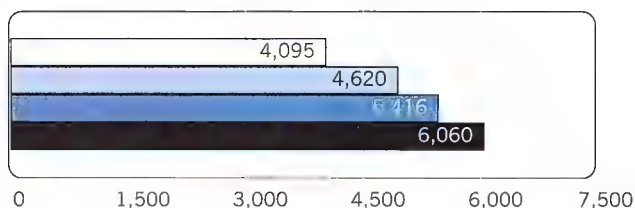
and 64-tap anisotropic filtering at a resolution of 1,280 x 1,024.

Compared to using only trilinear filtering as a baseline, the performance hit is similar to that seen when using antialiasing. The performance hit has a linear trend, starting at around 12% under 16-tap and jumping up to 40% when using 64-tap. This level of performance hit means that balancing antialiasing with anisotropic filtering is a difficult task, but with the insane levels of performance at high resolution there are strong arguments against a need for antialiasing at those resolutions.

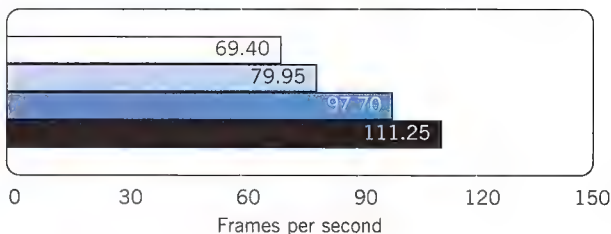
It is easy to say that the Titanium series is a pointless development for NVIDIA, mainly because it is. The one bonus is that it makes the once bloated GeForce2 series of cards a little less confusing, while simultaneously making the whole NVIDIA line-up a little more confusing. Why anyone would need a GeForce3 Ti 500 at the moment is beyond me, as the GeForce3 is still almost untouchable in the speed stakes (and has just gotten faster with the recent release of NVIDIA's Detonator XP drivers).

The GeForce3 Ti 200, on the other hand, should succeed in getting DirectX 8.0-compliant hardware out into more hands than the previous iteration of the card, which can only be a good thing. All we have to do now is continue the long wait for games that actually take advantage of it.

3DMark2001 Pro



Quake 3: Arena (1,280 x 1,024 max.)



- 64-tap anisotropic filtering
- 32-tap anisotropic filtering
- 16-tap anisotropic filtering
- Trilinear filtering only

SPECIFICATIONS

MSI GeForce3 Ti 200 Pro-TD

GeForce3 GPU at 250MHz, 64MB DDR RAM at 400MHz, S-Video and RCA TV-in, S-Video TV-out, 15-pin D-Sub

Web site: www.msicomputer.com.au

Supplier: MSI Computer www.msicomputer.com.au

Phone: (02) 9748 0070 Price: \$550

SPECIFICATIONS

MSI GeForce2 Ti Pro-VT

GeForce2 GPU at 250MHz, 64MB DDR RAM at 400MHz, DVI output, S-Video TV-out, 15-pin D-Sub

Web site: www.msicomputer.com.au

Supplier: MSI Computer www.msicomputer.com.au

Phone: (02) 9748 0070 Price: \$330

SPECIFICATIONS

WinFast Titanium 500 TD

GeForce3 GPU at 240MHz, 64MB DDR RAM at 500MHz, DVI output, S-Video TV-out, 15-pin D-Sub

Web site: www.leadtek.com

Supplier: Rectron www.rectron.com.au

Phone: (03) 9561 6166 Price: \$960





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www.coolermaster.com

PCPlus
EDITOR'S CHOICE

PCPlus Verdict.....9/10

Choosing which case deserves the Editor's Choice award wasn't a hard decision to make. For the ultimate in build quality, accessibility and good looks the Cooler Master has to take it. It's an absolute joy to work with and beautifully built. The only downside is that the price doesn't include a power supply.

MAXIMUM
EDITOR'S CHOICE

Verdict.....9/10

IF you want sexy, Cooler Master's Aluminum case has it in spades.

Cooler Master ATC-200 is simply the most beautiful case we've ever seen. Made entirely of aluminum, the cooler master is built with the fit and finish of an aircraft. The case is designed for ATX boards exclusively, with a mobo tray that slides out for easy maintenance.

ATC-210



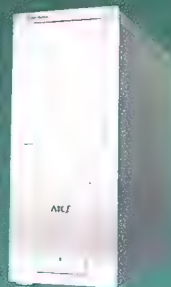
ATC-201



ATC-500



ATC-100



ATC-101



ATC-200



ATC-110



ATC-310



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Australia IT 10 Railway Parade Camberwell Victoria 3124



Hercules XPS 510

Stephen Dawson discovers remarkable value for money.



By the time you've reviewed 500 items of audio equipment, you realise that there are no shortcuts. Quality of equipment's performance, except for esoteric items targeted at the financially well-endowed audiophile, tracks the selling price remarkably well. That's a long-winded way of saying that you get what you pay for. Clearly a \$199 5.1-channel speaker system cannot be good quality, right?

Wrong – if the system in question is the Hercules XPS 510. We checked the price four times. We even emailed the distributor for confirmation that we were talking about the South Pacific peso, and not US dollars. Time and again Guillemot Australia confirmed the price, shattering our preconceptions.

The Hercules system is analog (that is, there's no digital decoder built in), so it is best suited to sound cards with 5.1-channel analog outputs. It can get by with a four-channel card by discarding the centre speaker. A built-in filter takes any bass from the satellites and routes it to the subwoofer, so a dedicated subwoofer signal is not required.

The amplifier offers 8W RMS for each of the satellites and 20W for the sub. Three stereo 3.5mm minijacks, or a Cambridge AudioWorks-style multipin analog connector, provide for input. There are three controls: bass level, volume and a power switch. These are inconveniently mounted at the bottom of the subwoofer.

All five satellites are identical small, plastic cabinets. On their little stands they measure 125 (height) by 50 (width) by 97mm (depth), and each weighs 390g. The subwoofer uses a bandpass design (the driver is fully contained within the box, with just a tuned port on the front to emit sound). The enclosure measures 237 by 170 by 317mm and weighs 5kg.

To test surround performance, we used the 5.1-channel outputs of a quality DVD player, using the Video Essentials test DVD. There was good imaging between the speakers, with a precisely placed 'virtual' voice at each position, all 360° around the listening position. Ho hum. We test this as a matter of completeness, because good surround performance is one of the easiest things to achieve in a surround speaker system, especially if all the satellites are identical as they are here.

The real tests of performance are the things that determine the character of the sound: frequency response, distortion, how loud will it go. Stuff like that. In my experience, cheap computer speakers have an iffy frequency balance, no deep bass at all and go moderately loud while producing high levels of performance.

By way of contrast, the Hercules XPS510 gives an excellent frequency balance across the musically important frequency bands, goes very deep and delivers 96dB at 1kHz from just one of the satellites before the built-in amplifiers run out of grunt. Up to that point (known as clipping), the distortion was only 1.3% for the second harmonic, and 0.5% for the third, rivalling the performance of speakers costing three times as much.

For frequency balance, the XPS510 delivered a frequency response of 40Hz to 12,000Hz, plus or minus 6dB. The treble goes up higher, but rolls off significantly by then. This HF limitation is the only indication why this system isn't significantly more expensive.

At the other end of the tonal scale, that 40Hz extension is brilliant. It fully encompasses the deepest notes of a bass guitar or double bass, the solid underpinning of a kick drum. It is a rare system at this price that produces significant bass below 80Hz.

There's a bit of suck-out for an octave centred on 750Hz, but that's the only major anomaly in the musically important mid-frequency band.

The sound quality was very good, with just a hint of distance imparted by that mid-frequency recess, and the deep bass not quite as tightly controlled as we would have liked.

But these criticisms are trivial when you take into account the price. You won't find a better sounding system than the Hercules XPS510 for less than double its price. □

SPECIFICATIONS

Subwoofer: bandpass, 20W RMS; satellites: sealed, five 8W RMS; special features: timber case subwoofer

Web site: www.au.hercules.com

Supplier: Hercules www.au.hercules.com

Phone: (02) 8303 1823 Price: \$199



WHAT HI-FI?

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www.yamaha.co.jp

*PC Computer System depicted is for visual purpose only. AP-U70 is compatible with PC/Windows & Macintosh, check system requirements.

Mass Storage Enclosure



Having the ability to move a hard disk around from one location to another quickly and easily is of benefit to most high-end computer users. With the relatively recent advent of FireWire, and last year's release of several FireWire hard disks, it has quickly moved to the fore as the preferred method for sharing drives and information between computers. The Mass Storage Enclosure doubles as a FireWire/USB hub as well as a drive. It's a breeze to install, and the case features automatic configuration and Windows/Mac compatibility.

The maximum throughput of FireWire is 400MB/s, which is ample considering the fastest IDE hard disks currently available rarely transfer data quicker than 80MB/s. One advantage of having 400MB/s of bandwidth to play with is that you have the ability to connect many devices without having to worry about data bottlenecks. We observed no latency when sending lots of information from several devices simultaneously (using two

Web cams – USB and FireWire – and a video camera at the same time).

One negative point regarding the Enclosure is that it is prone to overheating. Although hard disks don't get extremely hot during operation – with the exception of the new 15,000rpm speed demons – the ventilation around the hard drive bay is almost non-existent, as there is no ventilation above, below or around drive itself.

Although an extractor fan is fitted to the drive bay, there are only a few slots around the 3.5in drive panel cover that let in any air at all, so the effectiveness of the fan is minimal. Makes you wonder why a fan was included at all.

Having a FireWire hard disk is very convenient if you spend a lot of time lugging data from one place to another. It's far easier to simply plug in a box at the rear of a computer than dismantle computing machines, or use removable hard drives that require special bays. Combined with the low prices and high capacities of hard drives, this case makes for a very cheap portable mass storage device, with a capacity that most other portable storage media can't come close to.

As FireWire continues to become more prevalent in computers, with most new PCs coming replete with FireWire as well as being standard on all new Macs, more FireWire devices are going to be swinging onto desks in coming months. ☐

SPECIFICATIONS

Three firewire ports, one USB port, extractor fan, external power pack

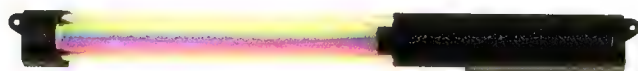
Web site: www.tryandbyte.com.au

Supplier: Anyware www.anyware.com.au

Phone: (02) 9906 5227 Price: \$248.60



12in Liquid Rainbow Neon



Newest in the long list of cool mods sold by Brisbane company PC Case Mods is a tri-colour neon light kit to supplement the single colour and black light tubes already on offer.

Included in the box are the light, wires, adhesive velcro strips and passthrough connector, so it can be piggybacked off another device's power supply. The light only draws about 4.75W of power, which probably isn't going to be the straw that breaks the back of your power supply. Also included in the package is a switch, and the installation instructions recommend that you use a cutting tool (such as a 'Nibbler', Dremel, drill or jigsaw) to cut through the case so you can install it in the front of your box. While this is a great idea, a lot of people will find themselves so mesmerised by the colours when they first test the light that they won't see a reason to ever turn it off.

It's good to have the switch there just in case, but most people will probably grab some electrical tape and bind the two terminals that should be connected to the switch together, so

the light will be on permanently (provided the computer is on). You can save money by buying the light without the switch.

The light is at the end of a 60cm wire that can easily be run outside of your case to wherever you might want to install the neon tube. The length of the tube is about 17cm, and the overall unit is about 30cm from end to end. At each end there are screw holes, so you can easily mount the light to a surface more permanently if you see fit.

Three colours dominate the display put out by the light: shades of pink, blue and green. The light output is bright and clear, and even in daylight the colours are clearly visible. That said, it is not bright enough to draw your attention away from your monitor or other source of light, even during the wee hours of the morning. ☐

SPECIFICATIONS

30cm in length, 4.75W power requirement, three colours, 60cm power wire

Web site: www.pccasemods.com

Supplier: PC Case Mods www.pccasemods.com

Phone: (07) 3207 1358 Price: \$55





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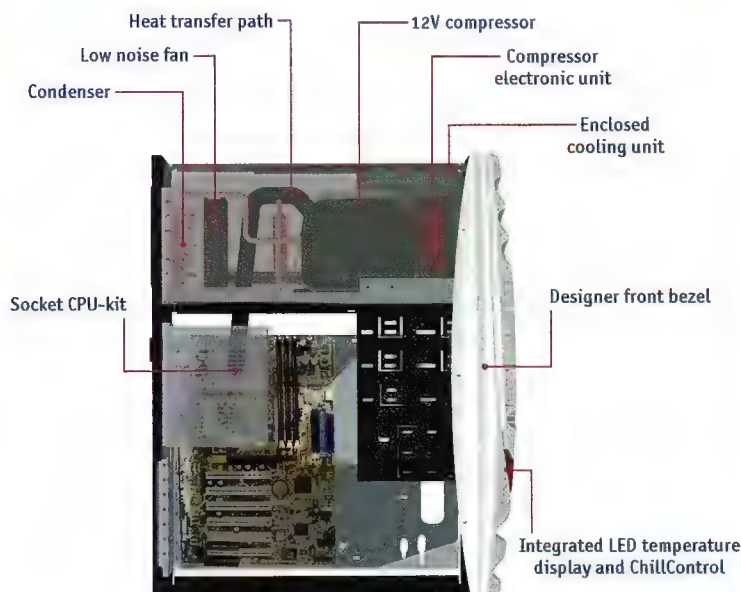
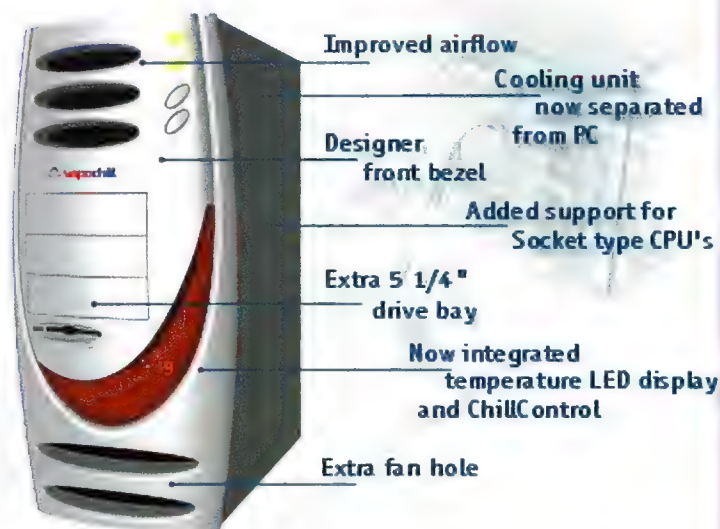
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CH Products USB PRO Throttle



If there is one sector of the PC peripherals market that is totally underwhelming in terms of product choice, it has to be HOTAS (Hands On Throttle And Stick) products. New HOTAS throttles are rarer than a multiplier-unlocked Athlon XP processor. But one of the few companies that has a history for building quality throttles has to be CH Products. Does its latest offering, the USB PRO Throttle, have what it takes to entice your sweaty little palms to reside upon this bulky mass of black plastic?

Compared to the Saitek HOTAS setup we reviewed last month, the PRO Throttle is a very utilitarian looking piece of hardware, with a plain design that exudes functionality over

aesthetic appeal. Instead of the rotary movement most HOTAS throttles have, this throttle slides back and forth in a perfectly horizontal manner. Also different to most throttle units – which plug directly into their accompanying joystick – the PRO Throttle connects to your PC via a single USB port. This makes it possible to purchase the throttle regardless of which joystick you currently use, making it possible to upgrade your simple joystick setup to a full HOTAS setup without the need for a new stick.

Like most HOTAS devices, this throttle is festooned with buttons and switches, and as such includes three 4-way hat switches, one 8-way hat switch, three buttons and a 3-way mode switch. Especially noteworthy is the miniature joystick within reach of your thumb. The accompanying programming software makes assigning game actions to the controller a breeze, and the overall comfort level of the device is excellent.

The biggest drawback of the PRO Throttle is its high price. At \$340 just for a throttle, this device is definitely for only the most hard-core of flight simmers. But when compared to the \$30 million or so that a real fighter will set you back, \$340 doesn't seem like such an unreasonable price. □

SPECIFICATIONS

LED mode switch indicator, USB connection, 7ft cable, Control Manager programming software

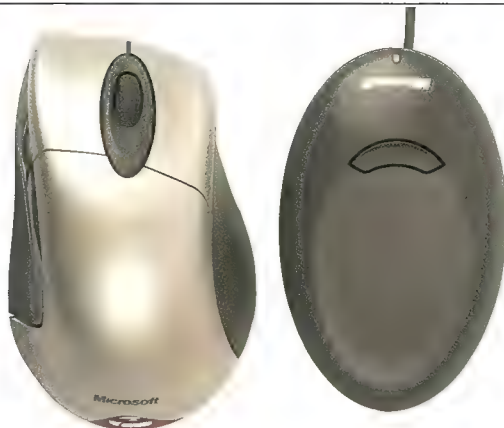
Web site: www.chproducts.com

Supplier: PC Aviator www.pcaviator.com.au

Phone: (03) 9532 8258 Price: \$339.95



Wireless IntelliMouse Explorer



If you're looking for a comfortable place to rest your hand for hour upon hour, the new Wireless IntelliMouse Explorer is hard to beat. Obviously originating from the Land of Ergonomia, this mouse fits into your hand like a well-oiled glove, although the largish size might take some getting used to for those who like their input devices on the smaller side.

The two thumb buttons, scroll wheel and the regulation left and right buttons all have that lovely Microsoft click to them – not too heavy, not too light, just right. A nice touch is the ability to enable 'super-speed' for the scroll wheel, allowing you to

churn through massive documents with a simple flick of the scroll wheel.

Being a wireless unit, the mouse needs its own power supply. Unfortunately, technology hasn't advanced to the stage where a miniature fission reactor could be implemented, so a pair of AA batteries will have to suffice. To ensure these last you more than a couple of rounds in Counter-Strike, power-saving features have been incorporated, activating the mice's optical sensors only when it is in use.

A few quick rounds in several games showed that this mouse doesn't come close to a normal mouse in first person shooters. There is a definite lag between your movement and what happens onscreen, resulting in very choppy movement. This suggests that the radio refresh rate is much lower than the optical sensor refresh rate. It's fine for desktop and 2D games, but for 3D engines it is simply woeful. So if you need a new mind/PC interface for your gaming needs, the Wireless IntelliMouse Explorer will do nothing but disappoint. □

SPECIFICATIONS

Optical sensor update rate: 6,000 times per second. Requires two AA batteries, 160g

Web site: www.microsoft.com

Supplier: Microsoft www.microsoft.com

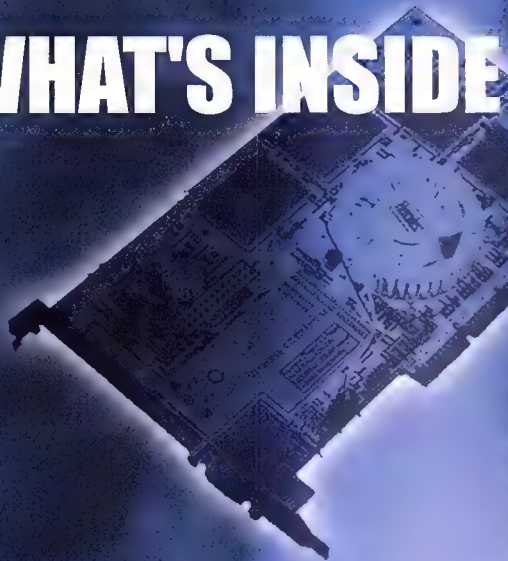
Phone: N/A Price: \$169.95



Athletes train and fuel their bodies to achieve maximum performance. Nutritionists advise us to eat a well balanced diet to maintain a healthy heart, body and mind. But, how do we go about improving our overall performance?

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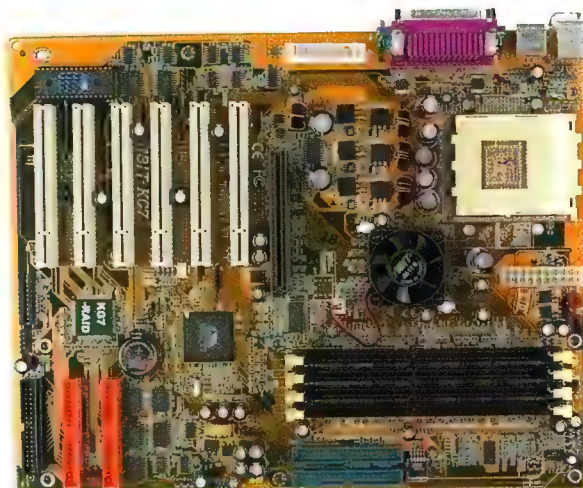
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ABIT KG7-RAID

Time for overclockers to rejoice as John Gillooly looks at ABIT's foray into DDR.



In the midst of the flood of Athlon motherboards this year, ABIT has stood out by launching a handful of highly engineered boards. Until the KG7 series of boards, there had only been SDRAM support for Athlons using ABIT's products, but its new DDR board is finally on the market after a long and intensive development process.

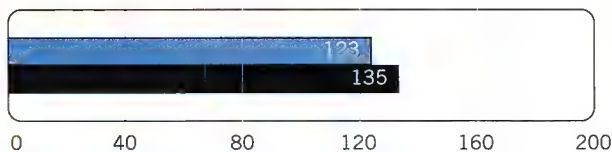
Based on the now familiar hybrid AMD/VIA chipset, the KG7-RAID has taken a long time to be released, coming almost a year after the initial launch of the AMD-760 chipset, and a good six months after competing solutions first hit the streets. The time spent in development was apparently invested in touches like the four DIMM slots (one more than any other DDR board Atomic has seen).

The board also supports the new Athlon XP processors, although at the time of writing this involved a BIOS update in order to get it running. Unfortunately, such support is lacking in some previous ABIT Athlon boards like the KT7, early KT7As and the budget KT7E boards.

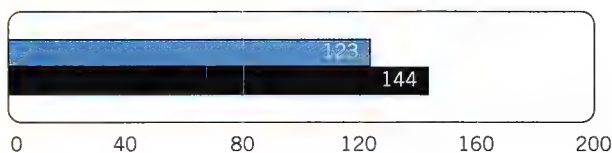
The popularity of ABIT boards among the overclocking crowd is legendary, and the KG7-RAID continues this legacy with a focus on functionality over the more common concessions being made by other manufacturers. The board just reeks of functionality, and this is borne out by the wide range of tweaking options in the BIOS. The board uses ABIT's renowned SoftMenu III for overclocking and voltage modification, and includes the flexibility for frontside bus adjustments all the way up to 200MHz (yeah, we can all dream) as well as voltage options for both the CPU and DDR RAM. Also present are extensive memory tweaking options, which must be explored in order to get the most out of the board.

Testing was done using a 1.2GHz Athlon processor with 256MB of 300MHz Odin CL2 DDR RAM. The tests were run after the memory was tweaked, which added just over 10 frames per second (fps) to the Quake 3 CPU tests. We tested the board using SYSmark2001 and Quake 3: Arena and the results have been compared to the ASUS A7M266, which also uses an AMD/VIA hybrid chipset.

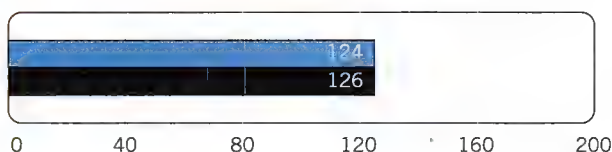
SYSmark2001: SYSmark rating



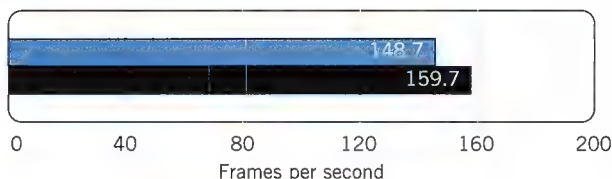
SYSmark2001: Office productivity



SYSmark2001: Internet content



Quake 3: Arena - CPU settings



ASUS A7M266

ABIT KG7-RAID

The results are impressive, with a significant boost over the A7M266 in all tests. It must be noted that the board's performance is slightly behind the MSI K7T266 Pro2 - which uses the new KT266A chipset - as well as the nForce-based boards. That said, the KG7-RAID contains a more comprehensive suite of BIOS options for the avid tweaker and overclocker.

If you're looking for a motherboard that will colour-coordinate with your video card, then this will disappoint. But if you are after a board that will allow you to extract bleeding-edge performance out of your components, then the KG7-RAID stands proudly at the head of a very crowded market.

SPECIFICATIONS

AMD 761 Northbridge, VIA VT82C686B Southbridge, HighPoint RAID controller, four DIMM slots, SoftMenu III

Web site: www.abit.com.tw

Supplier: Synnex www.synnex.com.au

Phone: 1300880038 Price: \$369



Cooler Master ATC Series

These boxes of bliss get the Bennett Ring run down.



overall case construction is of a high quality.

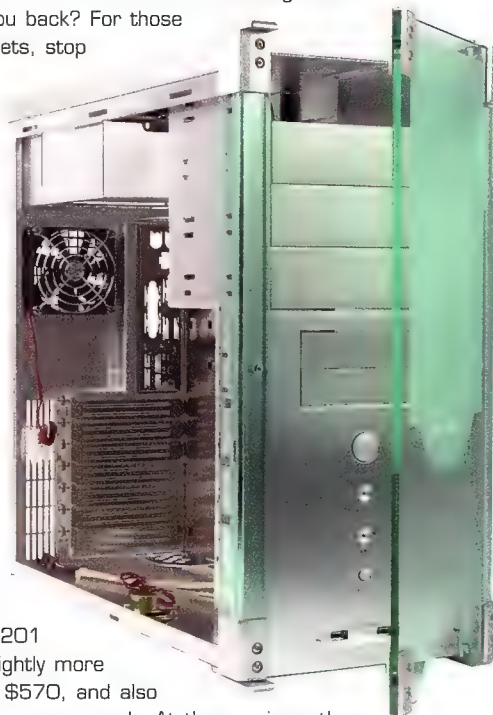
A nice touch on both cases is the inclusion of two USB ports – located at the base of the face on the 210 and hidden midway up the front, behind a small door on the 201. With the plethora of USB devices now flooding the market, these will no doubt prove to be useful.

But all of these features pale into insignificance when you first lay your eyes on these cases. We seriously recommend keeping a tissue box handy when you unpack your Cooler Master case, as it has a spooze factor greater than even the highest quality prOn. Without a doubt, these are the sexiest PC cases known to humanity, leaving even the Mac looking like an oversized plastic kid's toy. The 210, with its smoked-glass front door, is easily the nicer looking case. Even though the door can be a bit of a hassle when it comes to inserting and ejecting CDs, there is no denying that it simply looks amazing. That's not to say the 201 isn't a good-looking case, but it doesn't come close to the 210.

So how much is one of these fine looking cases going to set you back? For those with small wallets, stop reading now,

as these beasts are only for those with highly paid jobs, large inheritances or a thriving backyard drug lab. For the top-of-the-range 210, you're looking at around \$700, WITHOUT a power supply. Yes, you read correctly: 700

big ones. The 201 retails for a slightly more budget-friendly \$570, and also ships without a power supply. At these prices, they manage to make the Lian Li look like an item from the budget bin. It is for this reason alone that we can only give these cases a score of 8.5. But for the target market, price probably won't even be a consideration.



Until recently, a PC case has been a PC case has been a PC case. Much like the original Model T Ford, cases have been available in a wide range of colours – beige, beige or beige. But ever since Apple released its beautiful G3 case, the PC market has been racing to catch up in the aesthetics department. Lian Li holds the mantle for the most eye-catching case so far, with its sleek, brushed-aluminium lines – and equally eye-catching price tag.

Cooler Master, maker of el cheapo heatsink and cooling solutions, has now entered the rapidly expanding market of designer PC cases with its ATCS (Active Thermal Convection System) range of cases.

'ATCS' is just a wanky way of saying that these cases have fans. Both cases have a YS-Tech 80mm extraction fan mounted in a blowhole at the top of the case, as well as another YS-Tech 80mm extraction fan at the rear of the case near the PSU. The air holes for the blowhole look particularly attractive, and the relatively slow speed of these fans helps to keep noise levels to a minimum. Surprisingly, the cheaper ATC-201 has an additional two 80mm fans mounted at the front of the case, giving it a total of four fans.

Both cases are built mostly from aluminium, which makes them lightweight but also vulnerable to scratching. The ATC-201 is finished in a very professional-looking coat of deep-grey paint, but we have to say that the aluminium finish is more attractive.

Both cases have a tool-less design, with lots of lovely thumbscrews keeping them together. The now obligatory slide-out motherboard mount is also included, but the extension cable for all your LEDs, reset and power switches that you get with Lian Li cases isn't included. This makes sliding the motherboard in and out slightly more time-consuming, as you need to disconnect and reconnect each of these wires every time. Every edge within the case has been rounded, and the

SPECIFICATIONS

Four 5.25in bays, two 3.5in bays, four 3.5in hidden bays, removable motherboard tray

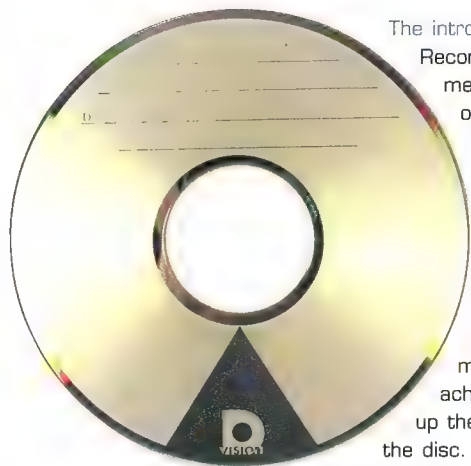
Web site: www.coolermaster.com

Supplier: Aus PC Market www.auspcmarket.com.au

Phone: (02) 9817 2899 Price: ATC-201 \$570; ATC-210 \$700



Division 90min CD-R



The introduction of CD-Recordable (CD-R) media that exceeds official specifications is not a new thing. Even the now common 80-minute discs actually violate the Red Book standard by five minutes. This is achieved by tightening up the data density on the disc. The leap to 90-minute CD-Rs pushes data

density to new levels, making them a boutique item.

Such is the case with the Division 90-minute CD-Rs. Designed to take 800MB worth of data, up from the standard 650MB, the discs have a huge potential. In reality, they are perhaps too good for the vast majority of burners. The reason behind this is that if a recorder is designed to conform to Red Book, it will certainly be able to cope with normal 75-minute discs, but it's

not designed to cope with the tighter data spiral on higher capacity discs. The majority of more recent burners will cope with 80-minute discs, but there is only a very small number that can deal with anything bigger.

The end result of using a 90-minute disc will depend on the model of burner you're using. To check which burners can handle these CD-Rs go to www.disc4you.com/news/99min.html, which gives the maximum disc size supported by a range of burners as well as what speeds the large discs will successfully burn at. We tested the discs using both an old 2x burner and a newer 20x burner. On both setups the discs burnt correctly, but the most we could squeeze out of the discs was 700MB, or 80 minutes of data. The resulting discs had no read problems.

If you have a drive capable of burning this much data, then the discs are worth a look. But for the vast majority of owners of older model burners, these CD-Rs are an unfortunate waste of potential.

SPECIFICATIONS

Capacity: 90 minutes or 800MB, rated to 16x burning, silver colour

Web site: www.griffler.com.au

Supplier: Griffler Enterprises www.griffler.com.au

Phone: 1800550442 Price: \$22.62 for 25



MSI 2010 PDA



This PDA from Microstar International is certainly one of the cheaper Palm-style personal digital assistants on the market. Geared toward the average Joe, rather than the corporate executive, the unit has a lot more going for it than its price suggests.

This device sports the DragonBall 33MHz RISC processor seen in many of the more expensive PDAs. In fact, at this price, we were pleasantly surprised at the number of features to be found. Connectivity is provided through an infrared port or, alternatively, you could use the desktop

cradle-style docking station. This model was fitted with an RS-232 connector, but is also available in USB. Applications include Name Cards, Schedule, Memo, To Do, Alarm, Painter, World Clock, Expense and E-book as well as a couple of games and a calculator. It is also good to see that email is well supported with an Inbox, Outbox, a Sent items folder and a Drafts folder.

The operating system is proprietary, but navigation is simple and will be familiar to anyone who has used competing Palm OS based PDAs. The clarity of the mono touch screen is crisp, and in addition to built-in contrast controls there is also a refresh rate adjustment of 50-60MHz.

The PDA comes with a small 2MB of RAM, and this is one of the reasons that the price is so low. However, 2MB goes a long way, holding thousands of entries. You can always have a look to see which record-sets are hogging the most memory if space gets tight.

The unit is let down by the way it handles handwriting recognition. The method used by MSI is based upon recognising actual lettering, rather than the Graffiti technology used in the Palm OS. Graffiti has its own set of letter-esque symbols, which makes the chance of confusion much less, and it soon becomes second nature. The onscreen writing style used by MSI is much less precise, and it does get confused, but again with practice it becomes fairly easy. If you hate the stylus so much you want to drive it through the screen, there is also an onscreen keyboard.

Generally though, in terms of bang for bucks, this solution for the budget driven PDA fan is well worth considering.

SPECIFICATIONS

Motorola DragonBall MC68VZ328 33MHz processor, 160 x 160-pixel resolution, proprietary OS

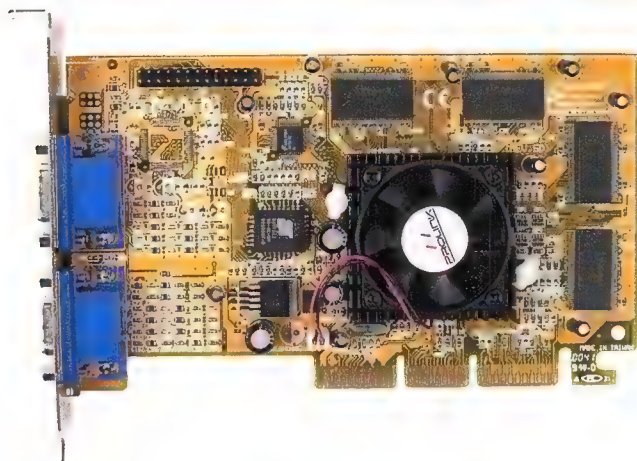
Web site: www.msicomputer.com.au

Supplier: MSI Computer www.msicomputer.com.au

Phone: 02 97480799 Price: \$269



PixelView GeForce2 MX Twin



Until recently, finding a cheap video card that provides decent dual monitor support, as well as playable frame rates for all your 3D gaming needs, has been a big ask. That changed with the release of NVIDIA's GeForce2 MX video chipset, and the PixelView GeForce2 MX Twin is the latest incarnation of this impressive value chipset.

When it comes to performance, this MX card performs just the same as every other MX-class video card on the market. It isn't the fastest card on the planet, but for the price provides admirable frame rates, especially at resolutions of 1,024 x 768 and below. A 350MHz RAMDAC ensures both displays are crisp and clear enough for all but the most anal retentive of users.

3D performance probably won't be too important to the majority of people who will end up buying this video card. Rather, the ability to run dual monitors on a \$225 video card will be the reason they choose this card over another. This video card doesn't have any digital outputs like some others on the market, instead shipping with two 15-pin D-Sub connectors. Considering that only monetarily advantaged people with buckets of cash are likely to have a device that can use a digital output, this won't be too much of a hindrance for the average peasant, er, computer user.

For such a low price, you can't expect this package to include the stocking filler of dud game demos, useless tweaking applications and drink coasters that more expensive video cards use to fill out their oversized packaging. You're supplied with a driver CD (with the expected obsolete drivers), a very slim manual and not a lot else.

This isn't the first TwinView card to hit shop shelves, but it is certainly one of the cheapest. For this reason, the PixelView GeForce2 MX Twin gets the Atomic thumbs up for those with a need to look like they're doing twice the amount of work as anyone else.

SPECIFICATIONS

GeForce2 MX chipset, 32MB SDRAM, two 15-pin D-Sub monitor outputs

Web site: www.prolink.com.tw

Supplier: Prolink www.prolink.com.tw

Phone: N/A Price: \$225



ASUS DVD E616



It is easy to argue that nobody actually needs a 16x DVD-ROM drive. A few years ago it looked like the short reign of the CD-ROM was coming to an end, and that the superior storage capacity of DVD was going to mean games and any other software would come on DVDs. And they did, for about three titles – Baldurs Gate, Zork: Grand Inquisitor, and Civilization: Call to Power from memory. (There are also rumours of a special DVD version of Civilization III due next year, but I wouldn't hold my breath.) But still the multiple CD games come out.

It is still a novelty to get any PC software on DVD, so for now the drives are mostly used for watching DVDs, which means that a 1x drive would be fine. In fact, the only thing a faster DVD drive is good for is ripping DVDs to DivX, and that is highly naughty and definitely not condoned. Of course, they also deliver quick CD speeds, but doesn't everything these days?

That said, DVD drives are fairly cheap, which means that

they are viable options if you are in the market for a CD-ROM drive and want to watch that copy of *The Matrix* you bought when it came out. The ASUS DVD E616 is a good option, with ATA100 support and fast CD performance. Add to that support for DVD-ROM/R/RW and DVD+RW media and you have a drive that will be fine until the next esoteric writeable DVD standard comes out.

When tested with CD Speed 99 (www.cdspd2000.com) the drive performed CD read operations at 48x. The DVD performance tested at just under 16x, which is not unusual for DVD drives, as the numbers fluctuate depending on whether or not discs are dual layer.

ASUS has again delivered a drive with solid performance. The only major problem with the drive is that it has a habit of taking 30 or so seconds to actually recognise some CDs (a habit we have discovered with previous ASUS DVD drives). If you want a DVD drive, then why not go for the quickest one you can find. You never know, you may actually need it one day.

SPECIFICATIONS

16x DVD-ROM, 7200rpm, ATA100, compatible with DVD-ROM/R/RW, DVD+RW and CD-ROM/R/RW discs

Web site: www.asus.com.tw

Supplier: Cassa Australia www.cassa.com.au

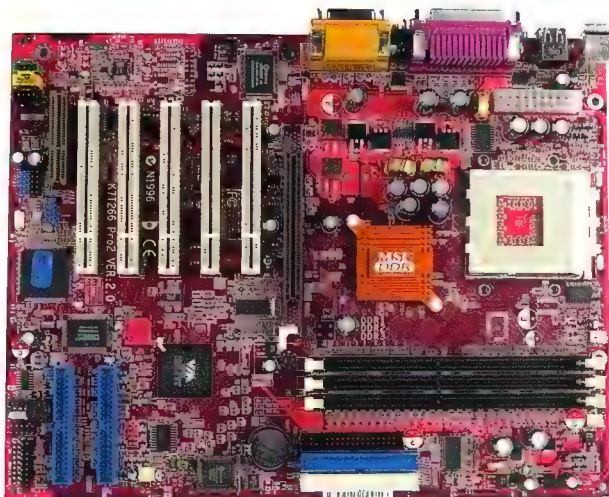
Phone: Cassa Australia (07) 5445 2992 Price: \$180





MSI K7T266 Pro2-RU

John Gillooly sees red, and likes it.



In the time that has passed since the launch of AMD's DDR platform for the Athlon, the AMD-760 chipset, the big three Taiwanese chipset developers have had their own stab at squeezing the maximum performance out of the Athlon and DDR RAM. Until very recently, however, the king of DDR performance has remained the 760 chipset, with the most popular performance motherboards using hybrid chipsets based around the Northbridge from the AMD-760 and a VIA Southbridge.

As a follow-up to its decidedly average DDR performer, the KT266, VIA has finally delivered its long awaited KT266A chipset, which sports a newly revamped memory controller. Like the KT266, the first kid on the KT266A block is MSI. It has delivered an amazing piece of hardware in the form of the K7T266 Pro2-RU motherboard.

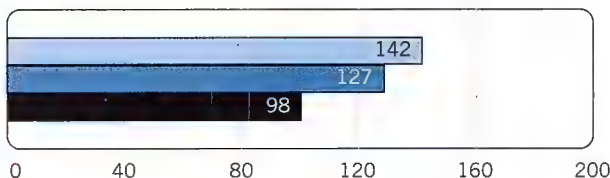
This is perhaps the most feature-heavy board to grace the Atomic Labs to date. Based around the red PCB, which first debuted with the K7T-Turbo Limited Edition series of boards, the K7T266 Pro2-RU also sports the D-LED diagnostics, USB networking, IDE RAID using a Promise controller and one of the first implementations of USB 2.0, with a separate onboard controller and four ports that mount via a blanking plate. These four backwards-compatible USB 2.0 ports mean that the board supplies you with an astounding eight USB ports.

The board's BIOS is incredibly overclocker-friendly. Besides the now common controls for voltage, multiplier and FSB the board also includes comprehensive RAM tweaking settings, including the albeit limited ability (when compared to ABIT's KG7-RAID) to tweak the voltage of the DDR RAM.

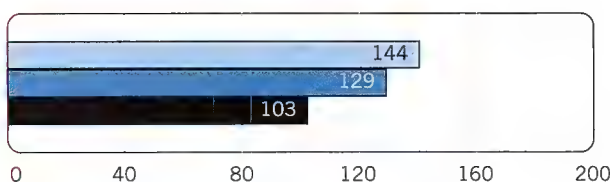
The need for speed

The board was tested using a 1.2GHz Thunderbird Athlon with 256MB of CL2 DDR RAM. We compared it to the same processor and RAM running on an ASUS A7M266 motherboard, which uses a hybrid AMD/VIA chipset, and an ASUS A7V133 board using the same processor coupled with SDRAM. The tests undertaken were SYSmark2001 and Sandra2001. (For game benchmarks check out the nForce feature on page 32.)

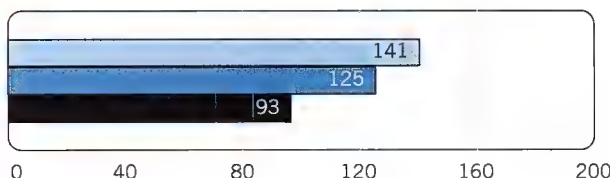
SYSmark2001: SYSmark rating



SYSmark2001: Office productivity



SYSmark2001: Internet content



■ K7T266 Pro2

■ A7V266

■ A7V133

In SYSmark the results show an average increase of just over 10% when compared to the A7M266. Even more amazing is the boost over the SDRAM-based A7V133, which averaged out at a tad over 45%. This huge leap in performance can be partially attributed to the fact that SYSmark will favour higher bandwidth memory due to its multitasking focus; however, this tells only half the story. In Sandra2001 the CPU benchmarks are constant between the K7T266 Pro2-RU and the reference Athlon 1.2GHz scores; however, the memory benchmarks both show a noticeable boost in theoretical bandwidth.

This board is an absolute screamer in anyone's language. Add to this an abundance of features, a good BIOS and the striking red PCB, and those SDRAM boards that used to hold their own against DDR all start looking slow and boring. I don't care if I have to beg, borrow or steal - I want one. Now. ○

SPECIFICATIONS

VIA KT266A chipset, IDE RAID, USB 2.0, eight USB ports, red PCB, D-LED

Web site: www.msicomputer.com.au

Supplier: MSI Computer www.msicomputer.com.au

Phone: 02 97480070 Price: \$395



MSI MX400 Pro-VT32S



One unfortunate thing about the shift towards coloured PCBs for motherboards and components is that if you don't watch out, the inside of your case can turn into a bizarre rainbow of mismatched colour. The easiest way to avoid this is to purchase hardware purely based on colour coordination, thus bathing the inside of your system in a blue, green or, in MSI's case, red glow. The MSI MX400 Pro-VT32S comes in a slick red colour and is designed to complement the latest MSI motherboards, which also come with red PCBs.

Apart from helping with colour coordination, the card also has some other features that help to differentiate it from the pack. The major one is the inclusion of both the common TV-out as well as TV-input, which you can take advantage of with the included WinCoder software. TV-out is via either an S-Video or an RCA output, while input is via an S-Video connector.

The card also features live BIOS update. This allows the BIOS of the video card (as well as the drivers) to be updated via the Internet. This saves a lot of hassle and, with MSI's SafeBIOS feature, it should eliminate the small chance of BIOS flash failure.

Unlike most MX400-based cards on the market, the MSI Pro-VT32S sports only 32MB of SDRAM rather than 64MB. The subtle twists do help this card stand out from its competitors, but with similar performance to the other cards out there, the buying decision will come down to whether you want a card that is red or you actually need to use TV output/input. As always, the choice is yours.

SPECIFICATIONS

NVIDIA GeForce2 MX400, 32MB SDRAM, TV-in, TV-out, red PCB

Web site: www.msicomputer.com.au

Supplier: MSI Computer www.msicomputer.com.au

Phone: (02) 9748 0799 Price: TBA



NAPA Dav 311



Yet another portable MP3 CD player has hit the market – the NAPA Dav 311. This gizmo is capable of playing MP3s stored on CD-Rs, VCDs and the standard audio CD. All these features are crammed into a compact package with a small, portable infra-red remote; audio/video cables; and stereo headphones. We tested the MP3

playback using 64Kb/s, 128Kb/s, 160Kb/s, 196Kb/s and 320Kb/s MP3 audio files. Playback was ideal at 128Kb/s and 160Kb/s, with very decent

quality sound and no errors. Surprisingly, at 196Kb/s the audio was extremely dodgy – skips, echos and distortion were a few of the common factors among the songs tested. Strangely enough, playback at 320Kb/s consisted of frequent chopping and loss of synchronisation. We noticed that at one point the time displayed

was '0:49' seconds when only 35 seconds of the song had actually been played.

VCD playback was tested using four different VCDs to make sure there were no inaccurate results. The video playback was adequate VCD quality. Frame rates were smooth on most VCDs, however, two of the VCDs had unacceptable playback. Both sound and video was quite jerky. On two occasions the player stopped responding and the only solution was to open and then close the lid.

The Digest feature in VCD playback proved to be most useful for skimming across those boring bits. The Dav 311 automatically breaks up the movie into five- to six-minute intervals and each selection has a thumbnail outlining whereabouts in the movie it will warp you to.

CD playback was also adequate – not the best we've heard but far from the worst. With MP3 CD, VCD and CD playback features included for only \$299, this player is exceptionally good value. The only factors that keep the Dav 311 from a higher score are unpredictable VCD playback and inadequate MP3 playback at certain bit rates.

SPECIFICATIONS

CD audio, MP3 and VCD player, audio and video outputs, remote control

Web site: N/A

Supplier: Griffler Enterprises www.griffler.com.au

Phone: 1800 550 442 Price: \$299







Terrorists Win

Has the whole world gone insane? John Gillooly assumes the answer is 'yes', and throws his hat in the ring.



The two simple words 'Terrorists Win' are ones that anyone who has played Counter-Strike will recognise. Unfortunately, they will not be what people see in the CPL World Championship, which is due to be held in Dallas in December. The change of nomenclature from Terrorist to Attacker and CounterTerrorist to Defender is one that survived a rather large backlash from the gaming community.

It all started with an announcement that Valve Software would be creating a special edition of Counter-Strike for the tournament. This was to have changed team names to clan names, locked down the models used by each team, changed generic team references to Attacker or Defender and swapped the bomb used in defusion maps with a much more politically correct Communications Device.

Supporters of the changes argue that the CPL was setup with the grandiose aim of making gaming into a mainstream sport. The recent shift of focus away from Quake 3 towards the more popular Counter-Strike can be seen as a significant part of these aims. One wonders whether or not Quake 3 would have suffered a similar fate – it is definitely a more gory game – but the fantasy setting means that the violence is generally more acceptable than something that references actual violence.

Commonsense prevailed and the bomb was reinstated after much bitching on the CPL forums, but these generic references still remain. There is logic to this; the World Championship event is seen as a big opportunity to push competitive gaming into the common consciousness. Considering recent events, though, how successful could a game featuring terrorism actually be?

That said, there has been a lot of strange reaction to the war against terrorism, from the understandable delays of games like Rogue Spear: Black Thorn (I wonder what the problem was with the mission they removed . . .), to the CPL events and something that has me frankly disgusted.

In the immediate aftermath of the events of September 11, there was a jump in the amount of

'hacktivism', with hackers heading straight for Web sites like the Taliban's United Nations delegation site. This sort of activity is not new, after China captured the US spy plane earlier this year, an almost full-blown defacement war started.

This is a small subsection of the online, and even hacker, community. The vast majority of hackers and script kiddies keep away from this sort of action. That does not stop hacking being potentially used as a tool of terrorism, but the chance of that happening is small.

Some of the parallels that have been drawn between hacking and terrorism have been shocking, but not in the way that you would expect. An article by the Gulf Coast .NET evangelist, Michael Lane Thomas, discussed the recent Gartner Group report that recommended business move away from Microsoft's Internet Information Server (IIS), largely due to the huge security problems that plague the package. Fair enough, but the analogies used were disgusting. The basic thrust of the article was that people who examine and exploit security holes in IIS are no better than the terrorists who examined and exploited security holes in America's air transport system in the lead-up to September 11.

Strangely enough, the point-counterpoint article in question lasted only a few weeks and has since disappeared from both the originating Web site, www.devx.com (which has been replaced with a 'content has been removed' page), and even Google's cache (no conspiracy theory about Google though, sorry).

That blanket statement, which actually encompasses all of the world's Internet security experts, is both reactionary and just plain untrue. Microsoft has recently been pushing a new Strategic Technology Protection Program (STTP) designed to make people more aware of the need for security patches and the like. Unfortunately, the biggest impact so far has been a statement that experts should not continue to inform people of bug exploits within Microsoft code.

The two statements, and the sudden use of the term 'cyber-terrorists' when referring to hackers, is frankly a knee-jerk reaction to a situation that is not a public safety one, but an issue of profit. If the security situation is so bad that reports are emerging telling people to just stop using the software, then Microsoft has a lot to lose. If you want to take a government security angle, I am prepared to wager that no security-sensitive American systems actually use Microsoft software – that's why we have Unix.

These diametrically opposite reactions to current events are worrying, and indicate that we are in for crazy times as we witness what is deemed publicly palatable in the wake of the events. Let's just hope that some sort of sensible middle ground can be found.

X-Com Enforcer

John Gillooly wonders why.



① Enforcer definitely looks great, it's just a pity about the lack of depth.

The X-Com name has a special place in the hearts of many gamers. The first two games in the series, *Enemy Unknown* and *Terror From the Deep* are still among the best turn-based shooters ever devised, and the series has diversified over the years to include spin-offs such as the space combat sim *X-Com Interceptor* and now, the third person shooter *X-Com Enforcer*.

Enforcer is a title that was borne out of impatience. The next big leap in the X-Com universe was to have been the long awaited *X-Com Alliance*, which is set to shift the original squad-based isometric action into squad-based first person action. This project has been in development for a while, and has suffered from the loss of a key team member earlier this year.

In the face of more delays, the team came up with an interim title, *Enforcer*. Using the same Unreal Tournament engine (and what appears to be a whole load of models and textures designed for *Alliance*), but with a third person viewpoint, *Enforcer* takes the basic combination of alien butt kickin' and scientific research and mashes them uncomfortably into a pure action game.

In this game (which takes place at a similar time to the first two games in the series) you play the latest invention of a lone X-Com scientist, a robotic alien-killing machine called *Enforcer*. The aim of the game is to run around destroying aliens, their teleporters and, occasionally, rescuing scared humans. In reality you run around shooting frantically, trying to avoid accidentally picking up crap guns.

The weapon system in *Enforcer* is perhaps the most bizarre aspect of the game. Weapons must be picked up and 'researched' between levels, which then allows the scientist to teleport them into the battle

'The weapon system in *Enforcer* is perhaps the most bizarre aspect of the game.'

area for you. The problem is that you can only wield one gun at a time, and this changes as soon as you run over another one. Of course, this always seems to happen at the worst possible moment. In the heat of battle the last thing you want is for your kick-arse shotgun to suddenly be replaced with a crappy little freeze gun just as a horde of nasty looking aliens bear down on you.

When you mow down an alien or achieve certain goals you are rewarded with 'data points', which are then spent between rounds on weapon or body upgrades, or to 'unlock' previously unresearched items that you came across on the previous level. This completely trivialises the research focus of the earlier X-Com games and is basically a bit of console-esque fluff.

Maps are highly reminiscent of the original isometric games – even down to the location of items like dumpsters – and they look fantastic. Similarly, the weapon effects and aliens are beautifully modelled and animated, with smooth movement at high speeds delivering a stunning visual effect.

The game is a chaotic blast fest, which is fun for about ten minutes. Unlike the frenzied action of games like *Serious Sam*, *Enforcer* gets dull very quickly and just keeps getting more and more repetitive. Add to this a truly awful weapon system and the general lack of anything related to a plot and you have a game that helps to reiterate that a quick development cycle does not make a good game. ○

GAME DETAILS

FOR: Fast, good-looking action

AGAINST: Boring gameplay, annoying weapon system, no in-game saves, everything else

MINIMUM REQUIREMENTS: 233MHz CPU, 32MB RAM, 4MB video card

RECOMMENDED: 600MHz CPU, 16MB video card

SOUND APIs: DirectSound

VIDEO APIs: Direct3D

DEVELOPER: Infogrames www.infogrames.com

PUBLISHER: OziSoft www.ozisoft.com

DISTRIBUTOR: Infogrames www.infogrames.com

PHONE: Ozisoft 02 83036800

Devil May Cry

George Soropos is a man, so he doesn't cry. That makes the devil a girl, doesn't it?

If you're an ex-console gamer or arcade freak you'll most likely remember scrolling action classics like Golden Axe and Final Fight. The genre mostly died in the late '80s to early '90s as more sophisticated technology allowed designers to do more with the structure of their games. Devil May Cry (DMC) may not look it, but the game is essentially an update of those old-time button mashers and quite different from newer forms such as the survival horror or action RPG.

Devil May Cry places you in the tight spandex trousers of Dante, the half-human, half-devil son of a legendary dark knight known as Sparda. The game's story revolves around the reawakened ruler of the

'Basically, you just kill everything that moves and keep walking forward.'

underworld and Dante's attempts to punch his clock, kick his bucket and be generally unpleasant to. For some of the game you'll also have the assistance of a beautiful woman named Trish, who invites Dante to Mallet Island, a gateway to her nether regions, or possibly the nether world. One of those.

Once in action the relation DMC bears to those '80s classics is instantly apparent. Basically, you just kill everything that moves and keep walking forward. You have access to two classes of weapon from the outset: your mighty sword and a pair of pistols, which can be improved upon in various ways. Your sword powers can be souped up by using red orbs gathered from demon corpses and your pistols can be upgraded with bigger, more powerful firearms.

The interface is fast and intuitive. It has to be, because your enemies pour down on you like water, and Dante is very quick when carrying out his attacks. The enemies you'll face get gradually tougher as you play, and that ever increasing difficulty is one of the better things about DMC as it keeps the player on the edge of their ability to succeed all the time. This is one game that rarely gives you a break.

Strangely enough, DMC actually began its life as a Resident Evil-style game. As a result it has been hamstrung with a graphics engine that has no support for camera movement. There are times when you cannot see the enemies you are fighting or don't realise the enemies are actually there, because they are hidden behind something. This can get more than a little frustrating.

As well as bringing back a retro style of gaming, Capcom has also attempted to bring back some retro style of a cultural nature. You may or may not be able to tell from the screen shot here, but the visual



design of the game is based around '80s 'new romantic' and 'poodle hair' Metal style. Why Capcom chose the two lamest cultural trends of that decade to be the basis of its game is a mystery.

DMC is yet another game that has been voluminously gushed over by the gaming press in recent months and has in fact turned out to be rather average. Aside from the cliches in both style and substance, DMC has another important flaw: it's way, way too short. Ten hours is all an experienced gamer will need to finish it; some might even do it more quickly. Ten hours is not a long time; it's two five-hour sessions. Two!

If you are after a quick and completely mindless button basher with no replay value to keep you amused for two or three days, DMC is a winner. But you're better off waiting for Silent Hill 2. O

i The devil would cry after getting shot by this bleedin' huge gun.

GAME DETAILS

O **FOR:** Intuitive interface; action, action, action

O **AGAINST:** Roughly 10 hours of gameplay is poor value. Almost totally mindless gameplay. Heroes in spandex?

MINIMUM REQUIREMENTS: PS2

RECOMMENDED: Memory card

DEVELOPER: Capcom www.capcom.com

PUBLISHER: THQ www.thq.com.au

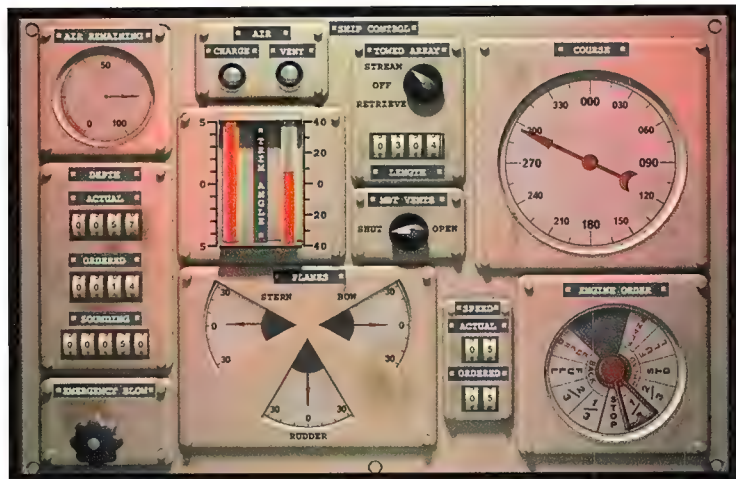
DISTRIBUTOR: THQ www.thq.com.au

PHONE: THQ (03) 95739200



Sub Command

Des McNicholas reaches for the Emergency Blow handle.



Control panel layouts are absolutely spot on, with most switches and dials accessible via mouse.

Submariners have had a long wait between depth charges, with *Silent Hunter II* still sitting tantalisingly on the horizon, and 688(i) fans facing the prospect that they already had it as good as it was ever going to get. Fortunately, 688(i) developer Sonalysts has teamed up with EA to produce a terrific simulation of undersea warfare. Setting new standards for accuracy and real-life complexity, *Sub Command* features stunning representation of boat systems, exceptional graphics and the tense atmosphere that's so important to games of this type. Sadly, many will never play long enough to find out because of the electronic manual, a barely adequate tutorial and the lack of any tactical advice.

Sub Command makes a great leap forward by offering three different boats to command, each with unique characteristics and weapon systems. Players can skipper the new US *Seawolf* class, the trusty Los Angeles 688(i) or the Russian *Akula* attack sub through two campaigns and 23 single-player missions. The missions cover the full gamut of nuclear sub operations including strike, reconnaissance, rescue and covert tasks, with a dynamic element ensuring some surprises during replay. *Sub Command's* three tutorial missions are fine (although there's not enough of them), and sub veterans will welcome the addition of a mission editor. This is a comprehensive package, rounded out nicely by cooperative and head-to-head multiplayer via EA.com, LAN or the Internet.

Sonalysts has managed to provide a solid interface for all three subs and the overall command functions. While players can choose to personally operate every key station, AI crewmen are also available, and those with a taste for the big picture can run just about everything from the map screen. Again, the online manual defeats the purpose of such high levels of detail, as modern sub systems are simply too complex to pick up on the fly. Remarkably, the small paper offering doesn't even provide a list of basic key

commands, suggesting instead that players refer to the game setup screen. All stations can be accessed through keyboard shortcuts, and all provide the critical status information on depth, speed and course.

Combat missions are tense affairs, as players try to find the enemy and remain hidden themselves. Once contacts are detected, it's a matter of using the boat's various sensors to improve fidelity and positively identify the target. Despite extensive tech support, success still comes down to judgement – particularly once systems fail and the water starts humming with decoys. Having confirmed a target, players choose the best weapon to engage it from a range of torpedoes and missiles, each of which demands pre-firing conditions that mean repositioning the boat, or risking detection by the enemy. As with all sub sims, *Sub Command* mixes long periods of concentration with short bursts of frenetic activity. Sonalysts has captured that atmosphere exceptionally well, although some players will be disappointed with the lack of damage control modelling and reporting.

Sub Command is undoubtedly the best sub sim of recent years, made all the more impressive by the modelling of the three boats, the inclusion of a first-rate mission editor and the introduction of online stalking under Russian and US flags. Purists will be well satisfied with the realistic missions and attention to detail, and those who more interested in capturing the feel of modern submarine warfare will be just as happy. Unfortunately, by forcing players to wade through the online manual, Sonalysts has missed a great opportunity to attract new players to the niche world of submarine simulations.

GAME DETAILS

FOR: Accurate, realistic and immersive; three boats to choose from; a challenging and diverse range of missions.

AGAINST: Inadequate documentation and poor tutorials – games can get away with one, but not both.

MINIMUM REQUIREMENTS: Pentium 233MHz MMX, 64MB RAM, 590MB HDD., 8MB DirectX-compatible video card

RECOMMENDED: Pentium III 450MHz, 128MB RAM, 32MB video card

SOUND APIs: Direct Sound

VIDEO APIs: Direct 3D

DEVELOPER: Sonalysts www.sonalysts.com

PUBLISHER: Electronic Arts www.ea.com

DISTRIBUTOR: Electronic Arts www.ea.com

PHONE: Electronic Arts (02) 9264 8999

Throne of Darkness

George Soropos plants himself upon a golden throne.

Throne of Darkness is the latest in a long line of action RPGs that began with Gauntlet in the Arcades of the Eighties and most recently continued with Diablo II. Set in the world of feudal Japan during the Year of the Fruit Bat, Throne of Darkness tells the story of seven brave samurai who oppose the newly risen Demon Zanshin and his plans to establish a global empire of evil and nastiness.

The main and virtually only focus of the game is combat, which is carried out by mouse-clicking on your opponents until they expire. In this regard, the game is identical to Diablo. The treasure and found items in Throne are also handled in the same way; they're either on the corpses of your enemies or in the many chests and boxes found throughout the game.

There are several important differences, however, the first of which is the party system. From the outset you have a team of seven samurai at your disposal (great film!), of which four can be in your party at any one time. These characters are slightly different from each other and have their own skills and abilities. Your Leader has the charisma to do all the talking and negotiating, the Brick has the strength of a bull, the Ninja has unique magical abilities, the Archer is expert with the bow, and so on.

One of the most interesting design elements in Throne of Darkness is the Daimyo system, which gives you a base of operations where you can instantly withdraw to, heal and organise your next raid. Your Daimyo is also the chap who gives you the main quests in the game; these are the 'strategic' quests. The other type of quest is known as a 'personal quest', which you pick up as you journey through the game. The most important job of the Daimyo, though, is to teleport party members back to base where they can heal and restore magic power. This can be done at any time and place as long as the Daimyo has enough energy, which he replenishes quite quickly. He can also resurrect dead characters, bringing them back with all their inventory intact.

As you can imagine these abilities make playing Throne a far more free-flowing and fast-paced game than Diablo or its sequel. It's almost cheating! To be able to send dead characters back for instant reanimation and then return them again to the fray keeps things moving at a breakneck pace.

Add to that the ability to call up your Blacksmith and Priest at any time and place, and you have a supremely streamlined game. The Blacksmith is there to repair items, make new items from parts donated to him by you or, most interestingly, modify items by using the many minerals and treasures that exist for that purpose. Your Priest exists to uncure and identify found items, and he also asks for his cut of your loot, but he is the only way to do either of these things.



There are lots of reasons for Diablo fans to like this game, but there are a few problems too. Targeting your enemies for attack can sometimes be almost impossible due to the intensity and speed of the action. The ability to remember and continue attacking a target after one hit would have been handy here. The frequency of equipment repairs early on in the game can be a little off-putting, but the situation improves as you acquire better gear.

Multiplayer takes a similar form to that Blizzard game, with Sierra.com providing the free online servers. A nice twist is that players can play as the bad guys as well as the good, with the victorious samurai becoming the Dark Lord's henchmen in the following game. Some gamers will balk at the low spec 800 x 600 resolution, especially those who have invested in a \$900 GeForce3 card.

i Sensei had it coming for a long time. Dojo this pajamaboy!

GAME DETAILS

FOR: Designed for Diablo fans with a similar style of gameplay.

AGAINST: Action focus and simple quest system may disappoint true RPG lovers. Engine for low-end machines – 800 x 600 maximum resolution.

MINIMUM REQUIREMENTS: Pentium 266MHz, 32MB

RAM, 700MB HDD, 4x CD-ROM drive

RECOMMENDED: Pentium II 450MHz, 64 MB RAM

SOUND APIs: DirectX

VIDEO APIs: Photoshop 2.3

DEVELOPER: CLICK Entertainment www.clickent.com

PUBLISHER: Vivendi www.vivendi.com

DISTRIBUTOR: Vivendi www.vivendi.com

PHONE: Vivendi 02 99044533

atomic

6.5/10

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Delivery charges (plus P+H): 1 item = \$10; 2+ items = \$15		\$
Total		\$

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 Surname: Mr / Mrs / Miss / Ms _____
 First name: _____
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 Country: _____ Postcode: _____
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Codename: Outbreak

David Kidd gets a nasty rash from the latest Outbreak.

Formerly known as Venom, Codename: Outbreak promised to be an innovative title with advanced AI, funky weapons and a healthy mix of stealthy, snipey action. After being mildly unimpressed with the demo, it's a shame that GSC has kept none of its promises, delivering a game that's dull, repetitive and uninspired.

The plot has something to do with a meteor and alien parasites, and is so ineffectual that you begin to freak out part-way through a level, because you have absolutely no idea what you are doing or who you're supposed to be. After choosing your squad mate, armour and weaponry you head off on either a large outdoor sniping fest or a sneaking, vent-dwelling, ladder-climbing key searcher, all the while fighting or avoiding infected soldiers, face-hugging aliens and any other enemy derived from a few select sci-fi films.

The objectives in each mission are basic search, escort and kill scenarios with waypoints displayed across the HUD compass. The HUD is also used for two other main functions: audio enhancement and squad mate camera. Audio enhancement is quite easily the most interesting aspect of the entire game and is activated simultaneously with the optical zoom feature. The ability to zoom in on conversations over a kilometre could have added an extra dimension to gameplay, but is sadly undermined by the fact that your opponents only have about three or four things to say to each other.

Typically your squad mate will tag along behind you and, depending on assigned orders, will either engage the enemy, cover or hold position. GSC worked hard on the enemy AI, having based it on line-of-sight and line-of-audio routines to make them react in a realistic and coordinated manner, but unfortunately for you, your squad mate arrived late when the algorithms were being handed out, and will happily shoot at an enemy through six walls of solid concrete even though he can't possibly see them.

The outdoor landscape is surprisingly detailed. Terrain varies from valleys and cliffs to bunkers and beachheads, and is peppered with sniper towers and rocket launcher nests. Navigating the wilderness is challenging and you'll become very familiar with the prone position and it's pop-up camouflage shell. Conversely, the indoor missions are spent crawling through air vents, 'rescuing' your stuck partner-in-arms and escorting even more frustratingly stupid scientists to safety.

While the outdoor maps can get away with lower polygon counts to deliver expansive environments, the primitive models in the indoor areas are blocky, square and not up to par with anything seen since Half-Life. To its credit, GSC has added very detailed textures on just about every tree, wall and dirt mound in the game. These can even be scaled to provide reasonable detail at nose distance. Unfortunately, they only serve to highlight how unrealistic the simple



polygon environments are, and no amount of pretty textures and rich colours can save it from that.

Finally, you can't talk about FPSes without mentioning the wide array of murderous and destructive weapons at your disposal. Outbreak contains only one gun with multiple barrels that allows you to select from a range of weapons including sniper rifles, SMGs and rockets – so ordinary that it is only barely saved by the excellent weapon sounds.

In the end, Outbreak is both a sprawling sniper fest and an indoor sneaker with little room for anything in between. While longevity may come from the multiplayer side it's hard to believe that anyone could choose to play this game over some of the more complete and stylish titles out there.

i The audio enhancement has nothing to enhance and the squad mate camera merely highlights his tendency to shoot at nothing.

GAME DETAILS

FOR: Expansive environments, original HUD features, fantastic sound

AGAINST: Squad mate should be certified and irritating bugs. Plot? What plot?

MINIMUM REQUIREMENTS: Pentium III 500MHz, 64MB RAM, 32MB DirectX-compatible 3D accelerator

RECOMMENDED: Athlon 1GHz, 128MB RAM, 64MB GeForce2 graphics card

SOUND APIs: EAX, A3D, DirectSound

VIDEO APIs: Direct 3D

DEVELOPER: GSC www.venom3d.com

PUBLISHER: Virgin Interactive www.vie.co.uk

DISTRIBUTOR: OziSoft www.ozisoft.com.au

PHONE: OziSoft (02) 8303 6800

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6/10

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SpyHunter

Get shaken AND stirred as Bennett Ring checks out this Bond wannabe.

What could be cooler than a jet-powered sports car that has the ability to morph into a boat, motorcycle and jet ski? The same car packed to the brim with guided missiles, cannons and defensive weapons, of course. Taking you into the hot seat of just such a car, the G-6155 Interceptor, is Midway's latest PS2 blastfest, SpyHunter.

This game is a remake of the classic SpyHunter racing shooter that graced many an arcade hall and Atari console back in the early '80s. As such it follows the same tried-and-tested formula that proved popular so many years ago. You play the part of a James Bond clone known as, wait for it . . . , the SpyHunter! You've been sent on a mission to save the world from the evil clutches of the NOSTRA corporation, which is plotting to take over the world, enslave all humans, kidnap Nikki Webster, etc, etc – a stock standard gaming story-line really.

In the course of your frivolous napalm-induced romps, you'll have to traverse 14 levels located throughout the world in your super-car, making sure you complete multiple objectives along the way. These objectives involve such delights as raising to the ground primary targets, tagging other targets with location beacons, driving through Sat-Com icons located in tight spots and, finally, making sure it's all done with the least amount of civilian blood spilt. I know that last bit doesn't sound like much fun, but the game does allow the slaughter of a few innocents before failing you, which is always good for a bit of a laugh.

The old top-down 2D perspective has been ditched for a modern 3D view from behind the vehicle, but the game still plays very much like the original. So you shouldn't expect Grand Prix Legend-type handling, as the SpyHunter likes his cars arcade style. The game engine is impressive for the PS2, conveying a great sense of speed without a trade-off in environment or object detail. Whether you're ploughing through a group of gun-wielding bikers or sending an armoured tow truck headlong into a brick wall, the effects used to depict the total annihilation of your foes are especially noteworthy. So is the morphing of your vehicle from a car to a boat and then, when a trip to the panel beater becomes imminent, to a motorbike or jet ski.

There are a large range of different bad guys to send into hell courtesy of your high-explosive rounds, and each behaves wildly different from the rest. They aren't quite up there in the Stephen Hawkins range of intelligence, but the sheer number of enemies makes them a competent threat.

While each of the 14 levels lasts for a mere seven minutes at most, the game isn't as short as it might seem. Most missions require you to complete most of the objectives before you can advance to the next mission, which turns out to be a bit of a pain.



It's usually fairly easy to complete the main objective, but some of the side objectives – especially activating Sat-Com icons by driving through them – require you to memorise the position of side roads and enemies. If you miss a jump, you'll have to start the level all over again. This means you'll end up playing each level at least three or four times before you can remember where everything is. It also means that the game can become frustrating to the point where you have no choice but to hit the eject button on your beloved PS2.

If you happen to have the patience of a priest or be blessed with a photographic memory, this single critical flaw within SpyHunter won't be a problem. Unfortunately, not many gamers fall into these two categories, so for the rest of us, the repetitive nature of learning the levels make what could have been an exceptional shoot 'em up average at best. You'll still have fun, but it probably won't last long.

❗ Is it a boat? Is it a car? No, it's a motorbike (for the time being)!

GAME DETAILS

FOR: Great visuals, fast and frenetic gameplay, wide variety of enemies

AGAINST: Repetition of missions leads to frustration.

MINIMUM REQUIREMENTS: Analog controller

RECOMMENDED: Memory card, sedatives to control frustration

DEVELOPER: Midway www.midway.com

PUBLISHER: Midway www.midway.com

DISTRIBUTOR: THQ www.thq.com.au

PHONE: Acclaim (03) 9674 5900

atomic

7/10

Lotus Challenge

George Soropos assumes his position on Lotus.



❗ Everyone knows that the 2001 Elise sucks compared to the '96. George takes up the country lane.

Lotus is a name steeped in British racing tradition. The Lotus Formula 1 team boasts no less than six championships between 1963 and 1978, as well as great names like Jim Clark, Emerson Fittipaldi and Mario Andretti. Lotus has also been very active in other classes of motor sport since the founding of the company, winning many European and British championships.

The company has always had a very hands-on approach to its support for motor racing and has carried that ethic into the game arena by being the very first auto maker to be actively involved in the development of a game, Lotus Challenge.

The most intriguing thing about Lotus Challenge is that, along with Metropolis Street Racer on the Dreamcast, it is one of the few racers that actually makes an effort to break the traditional mould. Before you even get near the track the game offers you a choice of control method, the usual analog thumb stick 'left-right' technique or you can try Kuju's all-new circular steering method – which is actually a big improvement over the old, without the need for any new gadgets.

Another equally innovative aspect of the game is its Challenge and Stunt modes. The Championship Mode is the typical racing mode where you compete in normal races against other cars, while The Challenge mode is actually the main focus of the game. In it you chose between the characters of Zoe or Jack and become part of the Team Lotus test squad. The game sets increasingly more difficult tasks for you to complete: fast times around a course, pulling off stunts for movies, even driving people to hospital!

Lotus Challenge offers a wide variety of courses in locations such as London, the Swiss Alps, Tokyo and Arizona. Nearly every one has been created to ensure

a heated, close battle. Later levels will require intense concentration as you weave around corners, desperate to clip vital seconds off the clock.

To make things even more intense Lotus features one of the best opponent AIs ever seen in a console game. Unlike the robotic driving of Gran Turismo 3's opponents, the other drivers in Lotus Challenge can make as many mistakes as you can – and drive just as hard. This is one of the few racing games seen on any platform where there are a realistic number of random accidents on the track, not just the ones you've created.

So why aren't we giving Lotus Challenge a score of 9 or 10? The overriding reason is its physics. Unfortunately, the developers tried to make a physics engine that is both 'realistic and accessible'. In other words it's a compromise.


When cornering, even with all the driving aids turned off, your car feels almost like it's on rails. It is possible to lose the car in a corner if your approach speed is too high, but you virtually cannot lose it by accelerating too early out of a corner. This gives the cars an artificial feel that detracts from the fun of driving them.


Audio and graphics are also disappointing. The overseas press, who are far easier to impress than the Atomic crew, has praised both these aspects of the game. Phooey! Lotus Challenge doesn't seem to utilise the graphic potential of the PS2 to its fullest at all, with most tracks being quite dull to look at. Far worse, however, is the audio. We're not talking about the music, which any self-respecting gamer turns off immediately anyway, but the engine sounds. It's hard to get excited by a car that sounds like an electric whipper snipper.

Lotus Challenge is an enjoyable and interesting racing title that will appeal to most gamers, though probably not the hard-core racing set.

□

GAME DETAILS

 **FOR:** Big selection of cars for Lotus fans and unique gameplay elements such as The Challenge and Stunt modes.

 **AGAINST:** Physics could have been better, graphics not up to the best PS2 standards

MINIMUM REQUIREMENTS: PS2
RECOMMENDED: PS2

DEVELOPER: Kuju/Lotus www.kuju.com
PUBLISHER: Infogrames www.infogrames.com.au
DISTRIBUTOR: Infogrames www.infogrames.com.au
PHONE: Infogrames (02) 8303 6800

atomic

8/10

Commandos 2



George Soropos fixes his bayonette and looks for somewhere to stick it.

The Commandos were formed from regular British units early on in World War II as the result of a desire to win a battle against the Germans after the humiliation of Dunkirk and the 1937 World Cup. By 1941 jaunty berets were rolling effortlessly off the production lines while David Niven's exquisitely trimmed moustache was striking fear into the German High Command. The time had finally come for them to strike back . . .

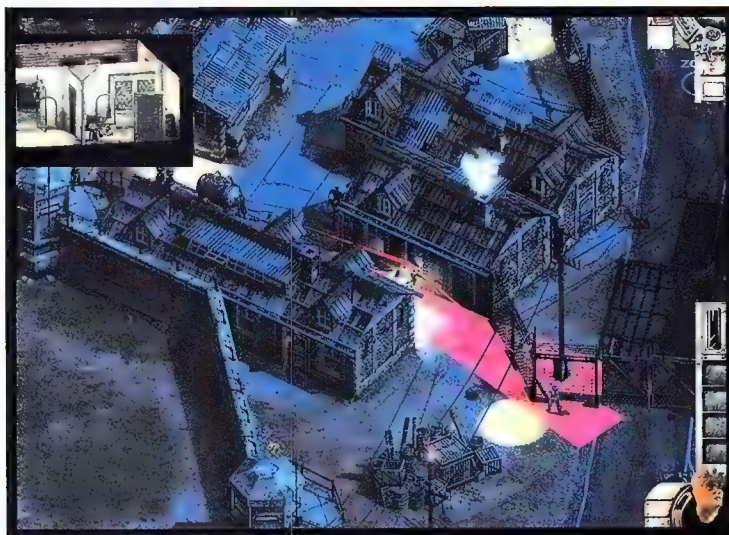
The original Commandos was a revolutionary game in that it introduced tactical thinking and planning into a traditionally action-based setting, focusing much more on the special skills of team members rather than the hand-eye coordination of the gamer. Commandos 2 massively expands the scope of the original design, adding so many new elements and variables to your missions that even seasoned players will need to re-learn the best tricks and techniques to complete missions effectively.

The heart of these changes is an all-new game engine that boasts unprecedented interactivity with the locations and items on each world map. Buildings are no longer just big obstacles but important places to find radios, documents, victims and a place to hide. You can order men to look into or out of windows to locate the position of enemy troops, and some characters can hide under bunks or in cupboards, climb poles, swing from cables and leap out of windows as part of the special skills. Of course, you can also use the door.

Your Commandos as well as the enemy are now genuine 3D models with a wide range of nicely animated movements. Another important change from the original game is that the 2D backgrounds can now be rotated by 90° to the four points of the compass – a very useful ability when you are trying to find a doorway or window. Building interiors are actually rendered in 3D to allow rotation of your viewpoint, so that you can see exactly who and where the occupants are.

Commandos 2 sees the return of only some of the original team; sadly a few were lost in a raid on a leather goods factory suspected of supplying crotchless panties to the SS. However, some more than capable replacements have been found including: the Thief, who can hide and leap and even pick pockets; the Seductress, whose skills with a pair of pantyhose are legendary; and even a doggy who can distract soldiers with his bark and pass documents secretly between your men.

The range of skill given to your men has been expanded slightly so that everyone can now wear uniforms, though only the spy can be an officer and move bodies. There are, of course, special skills available to each particular character, such as the Diver's ability to disable mines and the Sapper's ability to set trip-wires.



The mission types have also been spiced up with a host of objectives on each of the 12 maps and you even get to experience some pure combat action at times. In one early mission you are able to set up an ambush for a German tank raid and then just sit back and watch the fun.

Commandos 2 is by no means an easy game, even on the easiest difficulty setting. The learning curve for a new player is daunting to say the least, but not impossible. Twelve missions might not sound like many, but they are so involved that no-one will be complaining about finishing the game too quickly. Pyro Studios has created almost the perfect sequel and done wonders for PC gaming as a whole – you'll never see anything like Commandos on the PS2! ☐

i The new rotatable 2D backgrounds are gorgeous, and work well with the 3D characters in the game.

GAME DETAILS

FOR: New engine allows for more tactics, more complexity and more fun from missions.

AGAINST: Olympus Mons-like learning curve – not for the faint-hearted.

MINIMUM REQUIREMENTS: Pentium II 350MHz, 64MB RAM, 1G HDD, 8MB video card

RECOMMENDED: Pentium III 600MHz, 128MB RAM, 1.2G HDD, 32 MB video card
SOUND APIs: DX Sound, EAX
VIDEO APIs: Direct 3D

DEVELOPER: Pyro Studios www.pyrostudios.com.au

PUBLISHER: Eidos Interactive www.eidos.com

DISTRIBUTOR: Infogrames www.infogrames.com.au

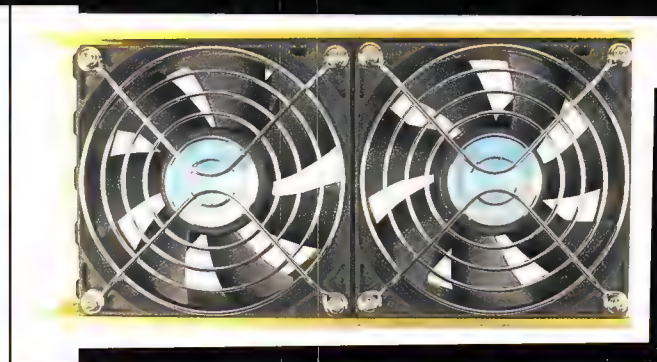
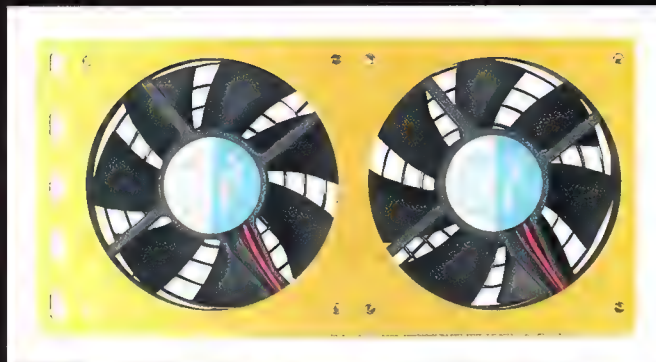
PHONE: OziSoft (02) 8303 6800

atomic

9/10

In, out, shake it all about

Sometimes even smart folk feel humbled by technology. Unless addressed early, this can evolve into technophobia. Is anything more embarrassing? Yes, there is, but this isn't the time or the place. We've saved a few more of you from doom this month, but we're most proud of our efforts with LOTM winner Marty. Anyware (www.anyware.com.au) reward Marty with the Rainblower. Stop laughing.



i Ahoy, matey!

I recently bought a copy of Windows Me at a swapmeet for \$80. I came home and did a clean installation and at first everything seemed alright; but when I shut it down, a blue screen appeared with the following message: 'An exception 0D has occurred at 0028: 00000003 in VXD—, it may be possible to continue, press any key.' But when I press a key, I get a brown screen with heaps of '——' across the page. I also sometimes get: 'Windows protection error, restart your computer.'

These errors have prompted me to think that maybe I bought a pirated copy, and some type of copyright protection is stopping me from shutting down. I have reinstalled Me four times and still I get the same results, so I can't think of any other reason. Can you guys explain what's going on before I report it to the authorities?

Marty

Unfortunately it's not copy protection doing this - if it was, your problem would be simple to solve. Windows Me has no such copy protection; the only Microsoft OS that does have such a technology is the newly released Windows XP, which uses product activation to stop people from being able to install a copy of the OS without a unique serial key. Even Windows XP gives you 30 days after installing it before demanding that you authenticate it (although a recent Windows XP installation we did somehow thought that after 3 days the 30 day period had already expired.)

That doesn't mean the software you purchased wasn't pirated, mind you. A large number of warez versions of Windows are sold at swapmeets. But it certainly doesn't mean that this is an illegal copy of the OS, either.

There are many other things that can cause problems like this. Some may argue the code itself would be enough. My first guess would be, one or more drivers that worked with your previous OS don't work with Windows Me. There are lots of Windows 95/98 drivers that don't work properly under Windows Me. Exploding messily when the system shuts down is one thing such drivers could do. Try installing the latest WinME drivers for every single device in your system.

i RAM rip-off?

About six months ago I purchased a Creative Labs 3D Blaster NVIDIA GeForce2 GTS 32MB AGP graphics accelerator. This video card works perfectly with the new Detonator XP drivers for Windows XP.

A couple of days ago, I checked the RAM chips on the card and discovered that they are labelled SGRAM, not DDR RAM as stated on the box. The box says, 'And configured with 32MB of Double Data Rate (DDR) memory effectively operating at 333MHz.'

Is this false advertising, or has Creative mass-produced the card with the wrong RAM? Should I be worried about this? Who should I contact?

Rodney Mayhew

Don't worry, you've got your DDR RAM. There's no GeForce2 that doesn't have it.

The markings on the RAM say 'SGRAM' (which stands for Synchronous Graphic RAM), because that's the kind of memory this is. If you fully decode the markings, though, you'll find that it is indeed DDR SGRAM. Six-nanosecond (ns) Infineon chips to be exact.

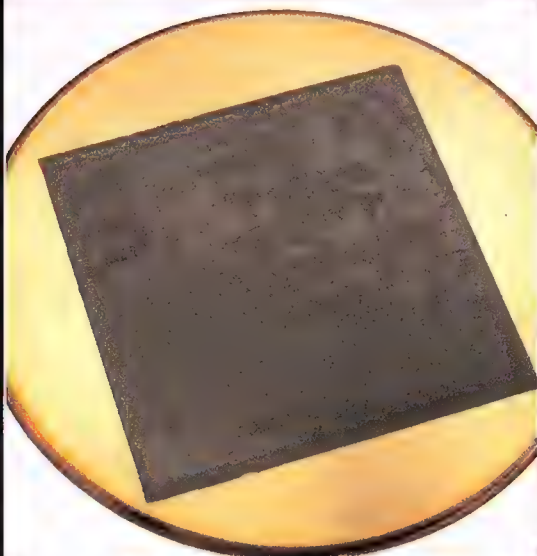
The 6ns rating refers to the memory's base clock speed. A nanosecond is one billionth of a second, so one tick every six nanoseconds is 166.7 million ticks per second = 166MHz. DDR does two data transfers per tick, so there's your 333MHz effective RAM speed right there.

By the way, Infineon chips are rated fairly close to their real performance ceiling. You're unlikely to be able to overclock the memory on that card by much more than 10%.

i Tape, goop or gum?

I have just purchased a 1.4GHz Athlon C with a Thermaltake Volcano 6Cu+ HSF to start building my own beast; however, I am unsure whether I should add some thermal paste between the CPU and the HSF. I am not planning to overclock. The 6Cu+ also has its own patch of thermal tape preinstalled. Will the thermal tape on the fan be sufficient or would thermal paste be better?

dk



i Lots of coolers, including the Volcano 6 models, now come with this sort of thermal interface material pre-applied.

o You can use thermal grease if you like, but you should remove the standard thermal gum if you do. That's not tape on the bottom of the 6Cu+; the stuff has a consistency more like chewing gum, and it will provide good thermal contact.

A thin layer of thermal grease (the absolute minimum needed to fill the tiny air gaps between processor contact patch and cooler) will give the cooler somewhat better performance. But a 6Cu+ should be fine with its standard goop.

You will have to use thermal paste if you remove the cooler and replace it, for whatever reason. Since it won't end up aligned precisely the same way as it was before, even when using it on the same CPU and motherboard, the squished out rectangle that the CPU presses into the gum won't line up right the second time. So you should clean it off, and then use thermal grease instead.

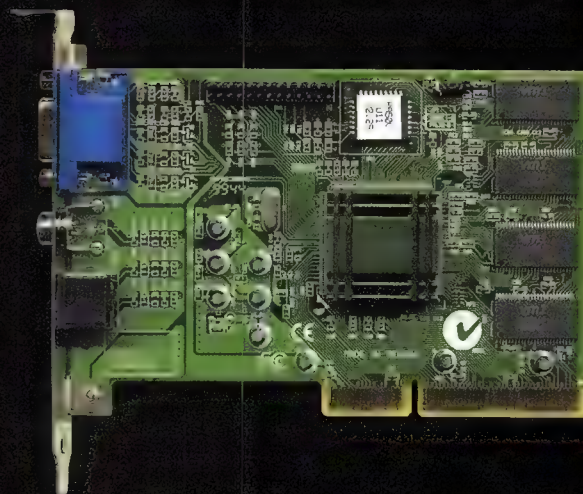
To remove thermal gum without scratching the HSF, dribble a little petroleum-based solvent over the gum. Zippo lighter fluid (naptha) works fine; paint thinner would probably be good too. Let it sit for a moment, then wipe off the gum with paper towels. You shouldn't need more than three dribble-and-wipe cycles to get the heatsink really clean.

i Clash of the dino-cards

I currently have a 400MHz Pentium II processor on a BX motherboard with 128MB of RAM, and the motherboard has an integrated SiS 6326 adaptor with 8MB of onboard RAM, with no AGP slot. I was wondering if it would help improve my graphics if I installed a 32MB TNT2 PCI?

Another thing: in Counter-Strike, there are three modes to select in the Video options: Software, OpenGL and Direct3D. Which is the best? I have noticed Direct3D blurs the screen slightly, although it lags a lot, and my video card doesn't support OpenGL.

Pujitha Fernando



i SiS 6326 video cards, like this AOpen Artist PA50, sell for under \$20 on auction sites. If you want to play 3D games, \$20 is a lot more than a 6326 card is worth.

o Yes, a TNT2 card would help. A lot.

By 1999's standards, the SiS 6326 had lousy 3D performance. By current standards, the thing is quite remarkably stinky.

If you can disable your onboard video (which isn't something you're guaranteed to be able to do – some older motherboards with integrated video don't play well with separate video cards) and install a PCI TNT2 board, you'll see a very worthwhile performance gain. Your frame rate still won't totally rock in hectic Counter-Strike games, though. There's a lot of number crunching involved with the game, and a 400MHz Pentium II will be working hard to keep up with that. But you will be able to manage a much better frame rate, and run in 1,024 by 768 with no worries.

With regard to the video modes, the Software setting turns off 3D acceleration altogether. It's the kind of 3D everybody had to use before the original Voodoo graphics chip came out. Everything you see on the screen is put there by the CPU; the video card just serves as a dumb frame buffer.

OpenGL and Direct3D are different 3D APIs (application programming interfaces). OpenGL is the cross-platform standard, and Direct3D is Microsoft's API. Generally, for Counter-Strike, OpenGL is the way to go, assuming you've got a vaguely capable 3D card, which you currently haven't. That 'lag' you speak of is your computer rendering the screen image. Direct3D lets almost any computer draw good-looking screen images, but without proper 3D hardware the frame rate will be appallingly bad.

Which 3D API to use depends on the game, your system and your video drivers. Some setups work better with Direct3D – like yours, for instance. Since, as you note, the 6326 lacks a proper OpenGL implementation,

i RAM mixing, chip toasting . . .

Just two quick questions. Can you simultaneously use PC133 and DDR RAM on the same motherboard? Would this depend on the motherboard, and if it's possible, does the DDR RAM just become a waste of money?

Second, my 1.2GHz Athlon CPU runs at a comfortable 37° under no stress, but as soon as it's under constant use – games, rendering, and so on – it rises to 58°. Is this detrimental to my CPU, or is it a normal and safe temperature?

Garuda

O No, you can't use two flavours of memory at once. Some Socket A motherboards have both types of memory slot, but you can only use one type of memory at a time.

Your CPU temperature isn't particularly alarming. But that reading probably isn't telling you how hot the CPU really is, anyway.

Palomino-core Athlons have an internal thermal sensor, which can be read by motherboards that know about it. Older Athlons don't. If you don't have a Palomino-core Athlon, your CPU temperature reading is probably determined by a probe that sits in the middle of the socket under the chip. The reading will be higher if the probe touches the bottom of the CPU than if it doesn't, and the calibration of the motherboard hardware that listens to the probe signal is another unknown.

The basic rule of thumb for Socket A CPU temperatures is that if the computer doesn't crash all the time, you don't have a problem. Even if a hot CPU does crash the computer all the time, that doesn't mean it's getting hot enough to actually be damaged, although you can destroy an Athlon and motherboard if your CPU cooler isn't attached properly.

i Hello-o-o-o-o . . .

I was planning on overclocking my system, and to avoid the noise, put my computer under the desk. My question is: how long can IDE cables be? I want to place the drives on the desk for easier access.

Brad Morris

O The maximum IDE cable length, according to the specification, is 18 inches. That's why you don't see a whole lot of external IDE drive cases. There are external boxes that accept IDE drives, but they connect to the PC with USB, IEEE-1394 or what have you, and contain bridge hardware that translates the two languages.

Many people use IDE cables a bit longer than 18 inches – 24in cables are common enough. But they're not a good idea, especially for Ultra DMA/66 and DMA/100 modes.

Then again, if all you want is access to a CD-ROM drive, you might be able to get away with it. You don't need 'easier access' to your hard drives, after all.

Stick to Ultra DMA/33 mode with a read-only device, such as your CD-ROM drive, and you might be able to make cables as long as 1m work. I know people sell cables that long, and they don't get swamped with an avalanche of returns from disgruntled customers, so IDE's built-in error detection must be dealing with the dropped bits adequately. Either that or these people's computers are so already flaky that they don't notice one extra bit of flaky behaviour.

It would be a lot more elegant if you used USB, IEEE-1394 or even SCSI-based peripherals, though. Those standards are meant to work with sufficiently long cables.

By the way, I bang on about this issue at great length at www.dansdata.com/rcables.htm.

i Magic upgrade

People keep saying negative things about the Intel 845 Pentium 4 chipset because it's not as fast as the same Pentium 4 on a board with RDRAM. But, as you know, Intel will be releasing full DDR support for i845 boards really soon. When it does, I'll upgrade my i845 to DDR, and I might get a faster Pentium 4 then, too. Both kinds of memory are cheap, so why not get an i845 board with SDR now and upgrade it to DDR later?

Bruce Johnso

O Um . . . well, because you, uh, can't. There will indeed be a second version of the i845 that supports DDR memory and performs better than the not-very-good-value SDR one. As I write, the latest rumours are that DDR i845 boards might even be out before the end of 2001. But i845 boards that use SDR memory will never be able to use DDR. It's not like a BIOS upgrade. The memory slots are physically different, for a start. DDR has 40 more contacts.

In the meantime, VIA has its P4X266 chipset, which is struggling to find manufacturer support, and SiS has a Pentium 4 DDR chipset on the way as well.

If someone sold you an SDR i845 board on the understanding that you'd shortly be able to use DDR RAM on it, then you have, as they say, been had.

i Freeze!

I have a 600MHz Athlon PC with a Gigabyte GA-7VX mobo, SB Live! and TNT2 cards, running Windows 98SE. The computer just freezes – no errors, just instant lockup whether I'm surfing the Net, playing games or just kicking back listening to some tunes. I have posted to your forums before (thanks to all the guys who gave me hope and ideas) with no luck, and have even taken it to the professionals (ha ha!) to no avail. What do you suppose it could be? I know it's not a software error, nor (I think) a heat problem.

Gary Smith

O There are lots of things that can cause this sort of problem. Periodic hangs are unlikely to ever be a software problem. It's more likely to be bad memory, a bad power supply, a motherboard or expansion card of lousy quality, or heat.

To rule out heat as the problem, open the case and let a desk fan blow into it. If that's not it, you just have to start swapping components and see what, if anything, fixes the problem.

Fortunately, most RAM is dirt-cheap these days. So it's no big deal to grab a new 128MB brand-name module, swap it in place of your existing memory and see if it helps. If it doesn't, try a new power supply. If you've got a yum-cha PC case with its standard super-cheap low output PSU still in place, that's a highly likely culprit.

Send your questions via email to io@atomicmpc.com.au or by post to: I/O Atomic, PO Box 275, Beaconsfield NSW 2014

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NB-600
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Remote Controller

RC-168
JUST COOLER
PC REMOTE CONTROLLER



3.5"/5.25" Bay System Cooler

ST-900

Mainboard Cooler
Forces air onto drive bay area to increase system reliability.



TT-900

Reversible Twin-Turbo Cooler
Keeps CD-RW drive cool, essential for reliable recording.



Security system

SS-100

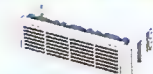
Security System
Power source & Reset locking by PIN. Built-in timer. Ideal for server protection or timed usage control.



5.25" Bay HDD Cooler



HD-100
2-Fan HDD Cooler



HD-200
3-Fan HDD Cooler



HD-120
2cm thick fan



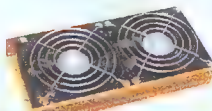
FC-610S
RAINBLOWER SYSTEM COOLER
68X73X30mm
Airflow:18CFM



FC-810S
RAINBLOWER SYSTEM COOLER
88X93X30mm
Airflow:32CFM



FC-1200S
RAINBLOWER SYSTEM COOLER
130X135X30mm
Airflow:90CFM



FC-910D
RAINBLOWER DUAL FAN SYSTEM COOLER 98X195X30mm
Airflow:80CFM

FC-500PS

FC-500 with installation adapter.
Fits printer port slot.

FC-100

Dimension : 120 x 90x 27mm
Airflow : 32 CFM
Voltage : DC 12V
System cooler for Pentium II & A.G.P. Card

FC-200

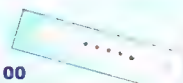
Dimension : 108x 90 x 27mm
Airflow : 32 CFM
Voltage : DC 12V
System cooler for Server, Raid, industrial PC (on SCSI port)



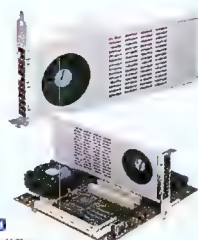
HD-600
Anti-Dust Cover Cooler
A specially designed housing base to prevent system overheating and accumulated dust.

FA-100

Fan Alarm System
A buzzer & pilot indicators with built in microprocessor. Detects up to 4 coolers' failure/malfunction.

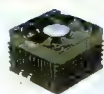


FC-900L
Central System Cooler
Draws heat out from mainboard & PC case.

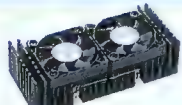


DR-100
Dehumidifier
A specially designed cooling fan which removes moisture from PC mainboards

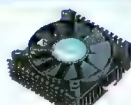
CPU Cooler / Second Fan



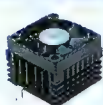
P-925B
For Intel Coppermine FC-PGA Socket up to 1GHz



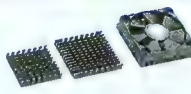
P-22A (Dual Fans)
For ATHLON (AMD K7) & Pentium II-compatible



P-600 (6cm Fan)
For Socket 370 600MHz and up



P-500
For Socket 7, Socket 370 500 Mhz and up



CS-100
Chipset cooler for AGP cards, mainboards. Adhesive type



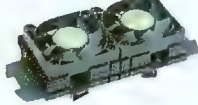
CH-420
AGP card chipset cooler (ball bearing) Clip type



SF-600
(60x60x25mm)
SF-800/SF-800B (Ball bearing)
(80x80x25mm)



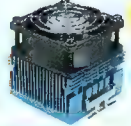
P-22SII (Dual Fans)
For SECC II & Pentium III



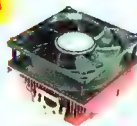
P-22C (Dual Fans)
For Celeron



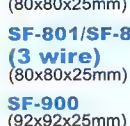
C1300
PURE COPPER HEAT SINK CPU COOLER FOR AMD/INTEL P3 UP TO 1.3GHz BALL BEARING



P-6000B
(BALL BEARING) CPU COOLER (6X6CM) FOR AMD K7 1.3 Ghz OR INTEL 1.13GHz.



P-8000B
(BALL BEARING) SUPREME (8X8CM) CPU COOLER FOR AMD K7 UP TO 1.5GHz OR INTEL 1.13GHz



SF-801/SF-801B (3 wire)
(80x80x25mm)
SF-900
(92x92x25mm)

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FAX: 03-9763 8400

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Osborne Park WA 6017
TEL: 08-9242 8588
FAX: 08-9242 8688

It's booty time! \$6,000 worth!

Bad news kids – Santa doesn't exist. So Atomic is taking the big fella's place. Get the question right and, just maybe, Cindy The Barrel Girl will randomly draw your entry!

At Atomic, we use the traditional David Jones calendar for determining when to commence Xmas celebrations – which means it's Xmas right now! Awesome, huh? Apart from alcoholic self-destruction, the secondary official method for engaging the Xmas spirit is giving away lush prezzies. Since there are many tens of thousands of you, we have determined that the Super-Duper Inaugural Annual Atomic CD is the prezzie for everyone. Like all good parental guardians, though, we have favourites – and those are the smart ones among JOO. Think of it as the usual Atomic comps, but with much more stuff and a special tingly feel of bells, holly, orbs and baubles.



Contact

Please email entries to win@atomicmpc.com.au or post them to Atomic, [Competition Name], PO Box 275, Beaconsfield NSW 2014. The closing date for entries is 19 December. Winners will be announced in Atomic 13. If you enter via email, please provide your full postal address.

Terms and Conditions of Entry. 1. The promoter is AJB Publishing Pty Ltd (ACN 083 063 914) of Unit 3/5 44-70 Rosehill Street, Redfern NSW 2016. Promotion period is from 9.00am on 21.11.01 until 12.00pm on 19.12.01. 2. Entry is open to residents of Australia and New Zealand. Management and employees of AJB Publishing Pty Ltd and their immediate families, and any advertising, marketing or promotional firms associated with this promotion are not eligible to enter. 3. Enter by posting or emailing forms to AJB Publishing Pty Ltd. 4. The draw will be held at the offices of AJB Publishing Pty Ltd at 5.00pm on 19.12.01. Winners will be notified by mail and published in Atomic 13. 5. The prizes are not transferable or exchangeable and cannot be taken as cash. 6. The judge's decision is final and no correspondence will be entered into. 7. The promoter reserves the right to publish the winner's name and suburb for promotional purposes. 8. All entries will become the property of AJB Publishing Pty Ltd.

Atomic 9 winners: 1GHz AMD Duron CPU, M. Cohen, Lindfield NSW

Q: What was Duran Duran's first hit single? A: Planet Earth

Next Competition: 3.3.02, Round 1, M. Harris, W. Ennis, J. Benedetti, K. Bonner

Q: Are there's signs of sentient biological creatures? A: Various biological creatures

THQ

Thanks to the luscious Estelle at THQ, we're sharing this stuff:

5 Red Faction + T-shirts

Score the game and a red-hot T-shirt!

Q: What was the first spacecraft to land on Mars?

5 Resident Evil: Code Veronica (PS2) + T-shirts

Unless all you like is GTA3, this is a rather enjoyable PS2 game.

Q: Is there spam in potato cake?

Logitech

With gratitude to the handsome Marco at Logitech, there's the stunning Logitech MOMO Force wheel – it's got metal bits!

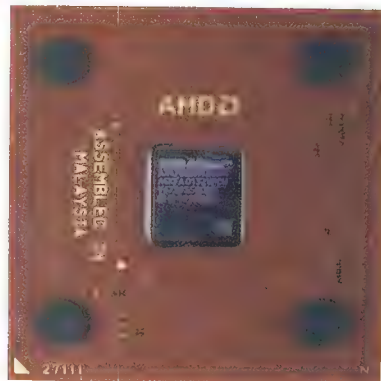
Q: At which track was the French Grand Prix held in 1967?



AMD

CPU superpower for the new millennium. The Athlon XP 1700+ CPU is a right little munter. Slip this into your socket and turn up the heat.

Q: Complete this word: supercalifragilistic



Microsoft

Due entirely to the sweetness of the beautiful and ever gracious Pammy at Spin, you could soon be sporting one of these packages, deemed by Atomic as the 'Greatest Input Pack of All Time'!

3 Microsoft Office Keyboards + Wireless Optical IntelliMouse mice

Q. What was the first phrase spoken over a radio transmitter?



Thanks to the drop-dead gorgeous Greta at Spin, we've got games to give away. Games = no work = fun. So maybe, just maybe, you could have some fun! We've got three packs, each containing Zoo Tycoon and Age of Empires Gold Edition, to suck away those otherwise useless end-of-year holidays. In case you're an ingrate Luddite and don't know, AoE is one of the greatest RTS games to ever hit the PC.

Q. What is an Ungulate?

**MSI**

With kind thanks to the generous and kind, but not in any way attractive, Jeffrey from MSI, we've swindled this swag of stuff:

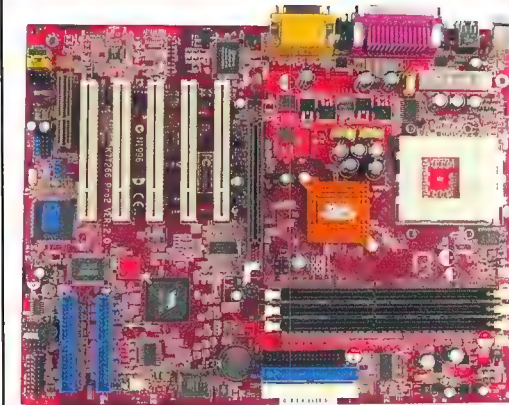
MX400 Pro-VT32

Q. What is Richard Nixon's middle name?



K7T266 Pro2 Socket A motherboard

Q. In which film did Kevin Bacon dance his way into the hearts of a town full of redneck hicks?



MSI EzyNow! PDA

Q. What is the longest word in the English language?



Separate entries are required for each competition. Email spammers will displease us.

The AXPOG: Atomic XP Optimisation Guide

Ashton Mills gets surgical with XP and hey, wow, whoa – this is the XP we wanted all along. Do you feel the need – the need to tweak?

Let me guess – you've got the gaming beast from hell and although your 3DMark2001 scores are higher than the scores of everyone in your suburb combined, you want more. Though your hardware is so beefy that you sneer at any resolution less than 2,048 x 1,600, you hunger for every last drop of sweet performance. It's just not enough. You want more speed, more power, more everything.

Atomic is here to give it to you. We can't help you if your hardware is lagging behind the times but, dammit, we'll make sure your latest Windows upgrade is slick, smooth and polished to perfection. Welcome to the AXPOG.

First rule of the AXPOG

Right. The AXPOG is broken down into a number of sections covering different aspects of the Windows XP system. Though it's not essential, it assumes a clean install. There are loads of tips, tricks, hacks and tweaks out there, so we'll focus on the most productive ones. Credit where credit is due – most of these tips are from the Atomic team, but some have been sourced from handy sites such as TweakXP.com (www.tweakXP.com) and the Windows Guide Network (www.winguides.com).

Before we get into the Optimisation Guide it bears mentioning, obvious though it is, that you install the very latest stable drivers for every subsystem in your beloved box – sound card, hard drive controllers, chipset drivers and so on. Notice, however, that we said 'stable'. We're not just going to dish out Atomic wisdom that'll help you squeeze more performance out of your system; we also want to make sure you keep your system stable. There's not much point having a sex-on-stick machine if it's going to crash on you ten times a day.

There is, of course, an exception to this rule: video drivers. Bar the odd releases where new versions of video drivers decrease performance slightly, or ones that only add undocumented third-party support, go out there and throw on the latest you can get. More often than not, cutting-edge drivers will give you more FPS for free. Beta is good most of the time, and when it isn't you can always roll back.

Second rule of the AXPOG

There's an overclocker in the heart of every geek, so I think it's safe to say most of you are running overclocked machines. Some motherboards allow you to do more than tweak the bus and multiplier settings; they also allow you to pump up the clock to your AGP bus and, sometimes, your RAM as well.

So if you're getting random crashes, especially after extended use, don't make faces at XP. Instead, try toning down (or, rather, toning up) the latency on your memory. Bar an overheating CPU and annoyingly obscure hardware incompatibilities (SB Live! anyone?), memory running at the edge of its limit is perhaps the single biggest cause for odd behaviour. Same rule applies to the memory on your video card.

That's not to say XP might not be at fault. It's no stable king, but it's a heck of a lot more stable than any previous Windows release. So make sure your hardware is operating in-spec before fiddling with XP, otherwise how will you know if it's XP, your beta drivers or your hardware that caused the crash?

What's the time? Tweaktime!

If this is your first time tweaking, you must tweak!

Grab a beer, put on your favourite 133t hax0r clothes, throw the cat on your lap and get ready to start tweaking! We guarantee once you start doing it, you'll never look back.

Usability and appearance

First up is the interface and, more importantly, how you use it. Let's clean it up a little.

I am Jack's system information tools

Where would an Atomican be without a useful set of tools on hand? While there are plenty of excellent third-party tools available (some of which are available on the Inaugural Annual Atomic CD), Windows XP comes with a good set of its own:

- **msconfig** can be started from the Run dialog box and allows you to tweak the startup configuration for your system, from INI files through to services and 'Run' entries in the Registry.
- **msinfo32** can be started from the Run dialog box. This is Microsoft's standard system information program. It's quite comprehensive and includes a set of tools including network diagnostics and Dr. Watson.
- **dxdiag** can be started from the 'Run' dialog box. This is the popular DirectX diagnostic and testing tool, which is handy for finding out all

you need to know about the DirectX capabilities of your system. It also includes an option to force the refresh rate in Direct3D, but note that this doesn't work with the NVIDIA Detonator XP drivers (see 'Refresh me baby!' for a fix).

- **ipconfig /all** needs to be executed from a command prompt. This useful program will list the specifics of your network devices: IP and DNS addresses, gateways, hostname and so on, for local network and PPP adaptors.

- **systeminfo** also needs to be executed from a command prompt. This program lists key system information, much like the 'procinfo' command under Linux. This is a quick and easy way to get a summary of your system.

Display

Right-click on the desktop and select Properties from the pop-up menu. Click Appearance → Effects → 'Use following method to smooth edges of screen fonts', and try out ClearType. Looks nice and is rather good for LCD monitors, but can be hard on the eyes for CRT monitors.

On the same Appearance tab, click Advanced and then click on the title bar, 'Active Window'. Scroll the size down to 20 to make the buttons smaller. It looks better and gives you a bit more screen real estate too.

Size 25



Size 20



High-end refresh – yeah, baby!

Similarly, you can reduce the size of the icons used in toolbars for Explorer and IE. Open up My Computer and click View → Toolbars → Customize. Set Icon options to 'Small icons'.

Click Settings → Advanced → Monitor and set the highest refresh rate your monitor can handle.

As any gamer worth their salt knows, the higher the refresh rate, the better.

Taskbar

Right-click the Taskbar, select Properties and turn off globbing, otherwise known as 'Group similar Taskbar buttons'. It can be handy sometimes, but if you're the type to have more than six browser windows open at once while running other apps, the globbing slows you down.

If you're running XP Professional, right-click the Taskbar, select Toolbars, remove the Language toolbar and add Quick Launch (it's turned on by default in Home) – handy for your most frequently used programs. Drag shortcuts to the bar to add new Quick Launch buttons. Unlock the Taskbar (right-click on it, deselect 'Lock the Taskbar') to resize the Quick Launch area.



The Quick Launch Toolbar is a handy feature, which is turned off by default.

Global access

Drag My Computer to the right-hand side of the Taskbar, near the icons and clock. This will create a cascading menu that allows you to navigate through to any folder on your system.

If you're one who likes to personalise your system, rename My Computer to the name you've given your beloved machine before you drag it to the Taskbar. As with Quick Launch, unlock the Taskbar to resize the area used by the My Computer toolbar.



Who needs desktop icons when you can strap My Computer to the Taskbar?

Start menu

Right-click on the Taskbar and select Properties → Start menu. This is clearly a matter of personal preference, but I for one like the Classic style better than the newer style of menu. Whichever you choose, click Customise and be sure to enable Display Administrative Tools. You're definitely going to need them.

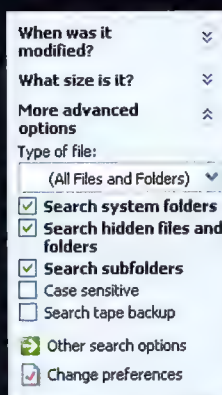
Under the same list, enable 'Show small icons...'. If you like being able to see your menus, rather than see the menus and programs that you used yesterday, disable the annoying 'Use personalised menus' option.

Search with style

If you use the Search function, be sure to tell XP you actually want it to search properly. Click through to Start → Search → All Files and Folders, and turn on 'Search subfolders' to include hidden and system directories.

Also, click on 'Change preferences' → Change Internet Search Behaviour and set the default search engine to a real search engine such as Google. This sets the search engine used by Internet Explorer.

Lastly, as it has absolutely no impact on the results of your search, disable the mascot!





Boot (C:)



Windows (D:)



WHITESTAR (F:)



RANGER (G:)

Some handy little hard drive shortcuts.



Windows (D:)



WHITESTAR (F:)



RANGER (G:)



DVD Drive

WOO! Shortcuts without the annoying arrows.

Drive it

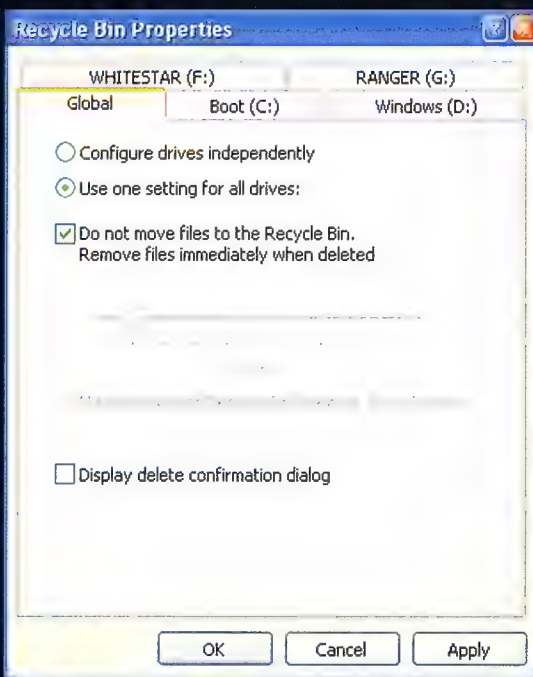
For one-click access to your drives, create desktop icons for each one; right-click and drag the drives from My Computer to your desktop and select Create Shortcuts Here.

Trash it

Right-click on the Recycle Bin and choose Properties. To save disk space and speed up deletions, disable the Recycle Bin. Select 'Use one setting for all drives' and then enable 'Do not move files...'. And, if you're truly elite, you can also disable 'Display delete confirmation dialog'.

Haven't heard of anyone who actually uses the Recycle Bin, so once you've disabled it you might as well remove it from your desktop.

Lets get dirty in the Registry. Click Start -> Run, then type in 'regedit'. Tunnel down to: HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\Desktop\NameSpace and delete what should be the third key, starting with '{645FF040...}'. Note the Default value inside is 'Recycle Bin'. You can always export and save this key if you ever want it back.



Delete confirmation - pffff!

Nicer shortcuts

Another old hack from previous Windows versions - removing the shortcut arrow. Fire up regedit and click down to HKEY_CLASSES_ROOT\lnkfile. Delete the 'IsShortcut' Registry value. Take note that just setting the value to '0' won't work; you need to delete it. You can also customise the shortcut settings using TweakUI in PowerToys for Windows XP, on this month's Atomic CD.

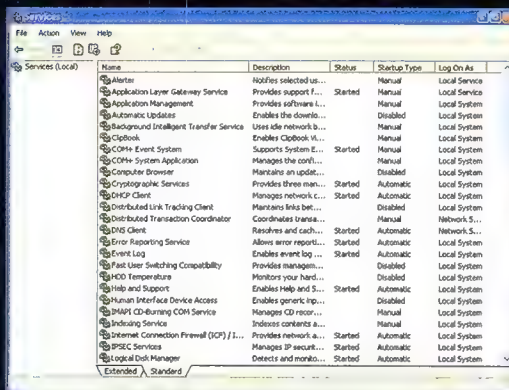
Services

Although this core tip belongs under performance, it's so chunky it needs its own section.

If you've used Windows NT, Windows 2000 or Linux, you're probably familiar with Services. They include not only the 'services' a machine provides - such as Web serving, file sharing, FTP, and so on - but also the internal programs used to manage data and general operating system tasks such as disk management, logging services, error reporting and file indexing.

Generally, you'll find a couple of services running that you don't need. Disabling them saves system resources and can boost performance. Head on over to Start -> Administrative Tools -> Services. You'll see which services are running, along with a handy description next to it. To save you time working out what you should and should not keep enabled, here's the Atomic list of disable-able services for preserving system stability, and they won't interfere with features such as Internet Connection Sharing and file sharing:

- Automatic updates
- Distributed Link Tracking client
- Fast User Switching (if you're the only user)
- Help and Support
- Network Configuration Awareness
- Portable Media Serial Number
- Print spooler (if you don't have a printer)
- Remote Access Auto Connection Manager
- NT LM Security Support Provider
- Remote Registry
- Secondary Logon
- SSDP Discovery Service
- Task Scheduler
- Universal Plug and Play Device Host
- TCP/IP NetBIOS Helper
- Terminal Services (if you don't use Remote Desktop)
- WebClient
- Windows Time
- Wireless Zero Configuration



The heart of your Windows XP system.

If you're not sure about a service, leave it on its current setting or set it to Manual (where it can still be started by programs if required) instead of Disabled.

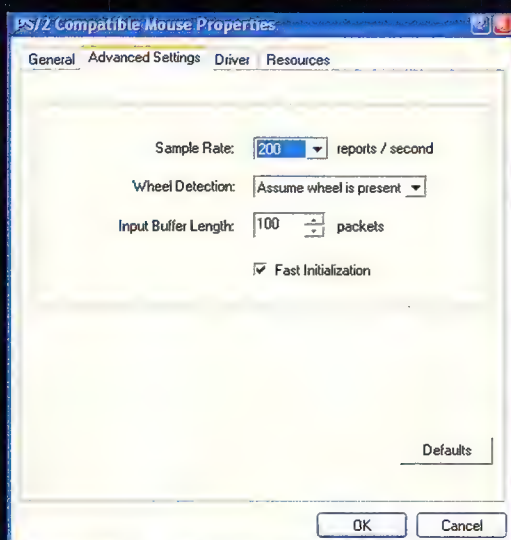
Panel it, baby!

Click Start → Control Panel → System → Hardware → Device Manager. There's less to tweak in XP than in previous Windows releases and, for the most part, hardware is configured for optimal performance.

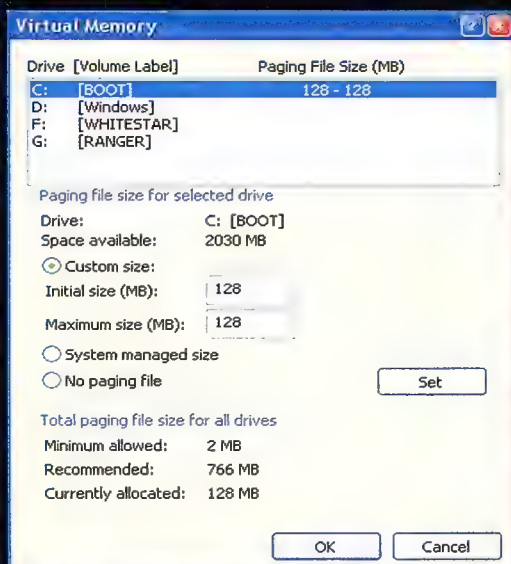
However, if you are a modem user, be sure to set your serial ports to '115200' and hardware flow control (under Port Settings for each port).

You can also speed up dialling by adding S11=60 to the initialisation commands under the Advanced tab for your modem, although this setting may not work on all modems.

If you have a PS/2 mouse, set the sample rate to 200 under Advanced Settings. Mmm . . . smooth.



① A high sample rate is a must for FPS gamers.



① First partition, static, 128MB swapfile. It's all you need.

Under Device Manager → Disk Drives, double-click on your hard drive and go to the Policies tab. Once there, check that 'Enable write caching on the disk' is on.

Back under System, click on Driver Signing (next to the Device Manager button) and choose Ignore. This will stop XP insisting that any new drivers you install may cause instability if they haven't been Microsoft approved. You probably saw this message when you installed those cutting-edge video drivers (Dammit, Windows! Of course I want to install the latest NVIDIA reference drivers!)

Still under System, click on the Advanced tab, followed by Settings under Performance. From here, click on yet another Advanced tab and, if you have 256MB or more, set Memory Usage to System Cache. Then, under Virtual Memory, click Change.

There is a popular yet utterly incorrect theorem that states that you should set your swapfile size to be double your memory. Bollocks! That was a good guideline back in the days of 16MB machines, but there's no way you need a 1GB swapfile for a 512MB system. Simple logic dictates that the more memory you have, the smaller the swapfile you will need.

For 128MB-plus machines, a 128MB swapfile is fine, or 256MB if you feel indulgent. Since that covers 99% of Atomicans, force the minimum and maximum sizes to be 128MB. Static swapfiles are always better than dynamic ones. To tailor your swapfile even further, see the 'The golden swapfile rules'.

Back under the System → Advanced tab, click on Settings for Startup and Recovery. If you've set up a multi-boot system, reduce the time-out from 30 seconds to 10. How long do you actually need to decide which OS you're going to boot?

Next, on the bottom of the Advanced page, click Error Reporting and disable this feature. Leave on critical notifications.

Still going in the handy System applet, click the Remote tab and then disallow Remote Assistance invitations. Similarly, if you value control of your system, disable automatic updates under the Automatic Updates tab.

Lastly, in the System panel, click on System Restore and disable the bugger!

File views

Open up your Windows drive from My Computer and click View → Details. Next, click Tools → Folder options.

From here, if you're a single-click type person, select the single-clicking option. If you haven't tried it, give it a go. Of course, when you select this you'll get those annoying underlines under every title just like in a browser. No problem! atomic solves all: Start IE, click on Tools → Internet Options → Advanced and scroll down to Underline links. Set it to 'Never'.

Back in the Folder Options dialog box, click the View tab and set the following options:

- ☒ Display contents of system folders
- ☒ Show hidden files and folders
- ☒ Don't hide file extensions
- ☒ Don't hide protected operating system files.

Lastly, click 'Apply to All Folders' to make your View style the norm.

No splash!

If you use Outlook as your email client, you don't need to be reminded of this everytime you start it up. Get rid of the splash screen by clicking down to HKEY_CURRENT_USER\Identities\Identity ID\Software\Microsoft\Outlook Express\5.0

Look for the value of 'Username' in each Identity ID to find the right profile, or simply add this tweak to all of them. Then, simply create a new DWORD value called 'NoSplash' and set it to 1.

Speedy navigating

These two simple tips will make anyone using your machine think it's really a 2GHz beast.

The popular 'menu show delay' hack of previous Windows versions still applies to XP. Fire up regedit and drill down to `HKEY_CURRENT_USER\Control Panel\Desktop` and set 'MenuShowDelay' to 0.

Now that your menus are slick, what about Explorer? If you've chosen to go the single-click path described above, you may notice that when you navigate files and directories in Explorer that they seem to open slightly slower than if you use the cursor keys and the Enter key to navigate. This is because the mouse is configured to wait and see if there's a second click to activate double-click commands, even if you've chosen to use a single-click interface. To fix this, head on over to Control Panel -> Printers and Other Hardware -> Mouse.

Since you don't need to worry about double-clicks being picked up, set 'Double-click speed' to fastest. Now, launching desktop icons, navigating directories and running programs will be activated immediately.

Interruption-free gaming

Windows keys are one of those things people either love or hate. FPS players more often than not fall into the latter category, because they're always accidentally touching a Windows key during heated combat. If you want to permanently disable them, this reg hack will do it:

Find `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Keyboard Layout`. Create a new binary value and fill it with: 00 00 00 00 00 00 00 00 03 00 00 00 00 00 5B E0 00 00 5C E0 00 00 00 00.

Don't page my executive

If you've got 128MB or more you might as well tell Windows XP to keep the core of itself in memory at all times, and not page out to the swapfile.

Fire up regedit and head on down to `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management`. Locate 'DisablePagingExecutive' and set it to 1.

If you set the Large System Cache in the System Properties panel earlier, you'll see the related key, 'LargeSystemCache', on this page.

Unleashing I/O

Windows XP normally limits the amount of RAM set aside for I/O operations to 512KB. You can override this and set a value anywhere up to 64MB. Under the same Memory Management key as the above tweak you should also find 'IoPageLockLimit'. Enter your chosen value in decimal notation. For 128MB machines, 8MB is ideal; for 256MB, 32MB; for 512MB, 64MB.

Tap, tap, tap!

Control Panel -> Printers and Other Hardware -> Keyboard. Set the repeat delay to be the shortest and the repeat rate to be the fastest.

You ain't never typed 'I Ownz j00!' so fast before!

Defrag

You know it. You love it. Do it. It's in Control Panel -> Administrative Tools -> Computer Management -> Disk Defragmenter, under Storage.

Messenger

This annoying piece of software gets its own section, because it's so incredibly annoying. As a tool it's not too bad, but the fact that Microsoft insists you use it by loading it automatically at boot time (waving 'Hey! Sign on to .NET pleaaassse!' in front of you) is just plain rude. It's even more annoying when you discover you can't easily disable it. Under no menu or configuration panel is there an option to turn it off, you can't uninstall it from 'Add/Remove Programs', and it doesn't appear in any startup folder or Run key entry in the Registry. An oversight? Er, no. Microsoft really doesn't want you using a rival instant messaging tool - ICQ, for instance - and so would rather not give you a choice.

There are as many tricks for removing Messenger as there are tweaks in this guide - use the Microsoft Management Console and this will cause Outlook Express to pause when loading, edit the sysoc.inf file and then try and uninstall it, or rip out multiple entries of 'msmsgs.exe' from deep within the Registry.

But there is a far simpler method - ancient wisdom passed down the ages from geek guru to geek guru. Browse to `\Program Files\Messenger`, select 'msmsgs.exe', and zap it (find that, Windows!). Of, course, you could rename it instead.

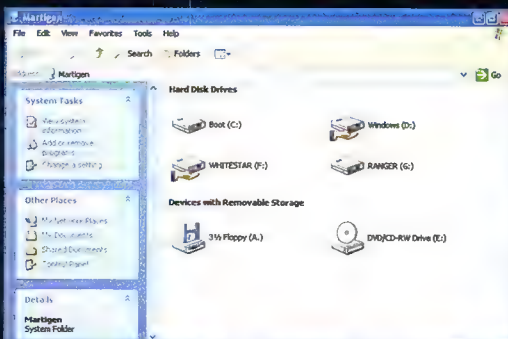


① Pure evil!

Shared schmared

Does anyone actually use the Shared Documents folder? Naw, didn't think so. Lets clean up our My Computer list by removing it.

Navigate to: `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Explorer\MyComputer\NameSpace\DelegateFolders` in the Registry (try saying all that in one breath!). Delete the key starting '{59031a47...}'.



① No more shared folders - just local storage devices.

Netiquette

If you use a dialup connection be sure to click Properties after you've created a new dialup entry, click Configure under the General tab and, if you plan to play a lot of games online, turn off modem compression. Yegads! Yes, it will improve your response time and, when playing over a modem, you need as low a ping as you can get. While you're on that page make sure your port speed is set at 115200bps.

Once you know the connection works, revisit Properties, click Options and then disable 'Prompt for name and password'. This saves you an extra click every time you connect to the Net.

Lastly, the in-depth science of tweaking TCP/IP settings for dialup and broadband access shall be left to a future feature, as it's a rather big topic.

The golden swapfile rules

This, my friends, is an ancient wisdom that is still applicable today.

Though memory is dirt-cheap these days, and the temptation is there to load up your system with as many DIMMs as you can get your hands on, chances are you don't have enough installed to warrant running 'swapfile free'. If you've got half a gig in your box, you can probably do so without noticeable problems as long as you're not running loads of beefy apps. But most people don't have half a gig, and if we get onto the subject of server machines, it doesn't matter how many gigabytes of RAM you have, you always have a swapfile. You may not always need it, but it had better be there when you do.

Because virtual memory is integral to the well-being of your machine, optimising its use can reap significant results, especially on low-memory systems. Hard drive flogging is a sure sign that virtual memory is being used Big Time, so helping your system to minimise access time and increase the transfer rate will go a long way to reducing said flogging.

We've already covered the ideal swapfile size, which should suffice for almost all system configurations (128MB if you've forgotten). Bar changing over to faster hard drives, the best way to improve swapfile performance is to follow these rules:

1) Place the swapfile on the most used partition on the least used drive.

This rule is self-explanatory and, if you have two drives, following it will ensure the time it takes for the swapfile to be accessed is minimised. Remember, access time is everything when you've got a hard drive pretending to be RAM.

There is a much deeper science behind this. For example, if you're using IDE you need to make sure each drive is on a master channel – if the second hard drive is a slave to the first, there's little benefit putting the swapfile on the second hard drive. Also, if one drive has a faster transfer rate than the other, you'll actually lose performance by placing the swapfile on the slower drive.

If you're running a single drive system, you obviously can't benefit from the use of a second drive, but you can take advantage of the second rule.

2) Place the swapfile in the first or second partition on a drive.

When you create partitions on a drive they are created outside-in on the drive platters, and the outer tracks of the disk transfer more information per revolution than the inner tracks. The fastest place for the swapfile, then, is as close to the start of the disk as possible.

Variations of this rule include placing the swapfile in its own partition (like Linux does), as this reduces fragmentation and increases access speed. File systems also play a role in transfer speed; FAT32, being simpler, is generally faster than NTFS.

But with the generally fast speed of today's drives these details are rapidly becoming redundant. Just place the swapfile as close to the start of the disk as possible. Some third-party disk defrag tools will allow you to move the swapfile to the start of a partition, and this is a good thing.

3) Force the size of the swapfile.

Forcing the size of the swapfile means Windows won't spend time, and waste I/O bandwidth, managing a dynamic swapfile. And, once the partition the swapfile resides on is defragmented, you'll have a sequential swapfile, making it faster too (there won't be a need for the drive heads to jump all over the disk reading fragments). This leads us to the last rule.

4) Defragment the swapfile partition.

This only needs to be done once after creating a static swapfile. And we all know the wonderful benefits of defragging!

Also, although NTFS is generally more resistant to file fragmentation than DOS, it doesn't mean you won't need to defrag. Do it once a fortnight and you should be fine.

By now your Windows XP system will be a lean, mean application-running machine. There are a whole swag of other tips and tricks out there, with many weird and wonderful menus to explore and Registry entries to haX00r in the pursuit of even more performance (we can all be greedy at times). But you are now a long way along the track to blistering speed and power. □

I am Jack's sore eyes

Gotta love NVIDIA for its Detonator XP driver set, but one does have to ask: what's the deal with the refresh rate in games? For all of NVIDIA's technical prowess, it still hasn't released a simple tool to define and set refresh rates for the desktop and in games. This is something Matrox has been doing for years.

Not a problem, really, because a whole swag of third-party tools appeared on the Web that allowed you to do this by directly editing the refresh rate tables in the Registry. With the release of the Detonator XP drivers all of these tools were broken, and for a short while many gamers were forced to play games at a crummy 60Hz refresh rate. At

the time of writing some of these tools had been updated to accommodate the Registry changes the Detonator XP drivers introduced (the main feature of which was to move the entire NVIDIA tree from 'nv4' to 'nv!').

Rather than cope with sucky eyeball-drying refresh rates, get online and grab NVReffix (www.planetquake.com/ztn/nvreffix/nvreffix.html) or NVMax (www.nvmax.com). If you like doing things the hard way – and we all do at times – there is a guide for undertaking a manual fix by editing the driver inf files available at: efceleron.hypermart.net/articles/nvidia_fix/det4.html

Free speech

In the future, we'll probably conduct some kind of survey to determine just how much smarter Atomicans are than the rest of the populace. Until then, anecdotally, it seems you're firmly on top. POTM and LOTM each score a whiz Microsoft Wireless IntelliMouse Explorer. Super!



Post of the Month: Be nice

Erolit reminds us all to be nice. Which is nice. Just about everyone knows that warez is not something to be discussed on our forums, but as Erolit points out, a friendly warning can be as powerful as a bad-arse smackdown.

www.atomicpc.com.au/forum.asp?cat=ge&top=18047

In response, anyone that makes a warez post probably hasn't read the FAQ or doesn't know the Atomic community very well. When Kriz made that post about warez, I thought you all were a bit harsh with your 'Piss off Kriz' and 'Delete and kick the shit outta Kriz'. He has done the wrong thing but he didn't know! If you went and asked if Myer sold hongs or some shit, you wouldn't expect the guy to jump over the counter and kneecap you with a trolley pole and put you in jail, would ya? In future why doesn't one Hero or Atomic staff doDD just post a message and leave it at that?

ChunderVision

Ever since I bought my first copy of Half-Life, I began noticing something very strange during the first few minutes of play. I started to feel very nauseous and dizzy, like I was going to throw up. After ten minutes I finally had to turn the game off and go lie down because I was going to faint. I thought it was only that game, but recently I hired Gunman: Chronicles, which is built under the same Half-Life engine, and the same thing happened. However, I have no problems with any other first person shooter games. I was just wondering if anyone out there has ever had the same problem before and if you guys know what causes a game to make someone feel this way?

Martin

Letter of the Month: Silastic

I am very fond of Silastic and am always looking for an excuse to use tubes of it, just as I am always looking for an excuse to light fires. I understand. But you should understand too.

Air is shit. I don't care whether it is at -20°C or 0°C or +20°C. Air is shit. Water is good. That is why we use it to cool our V8s. It's got a high specific gravity and can carry away a lot of heat. Much more than air. If it is good enough for your V8, then it is certainly good enough for a pissy 300W PC. Right? When real computers were real computers, they had real logic and that meant Emitter-Coupled Logic using a manly 5mA per gate. So we had real pipes carry real chilled water to keep our parts cool.

So let's get the Celeron out of the fridge and mill up a nice thick copper heatsink. Take some copper pipe bent into comely curves and solder it to the heatsink. Use about as much 50/50 solder as you would have done Silastic. Take the ends of that copper pipe out to some hi-female pneumatic connectors inserted into the backing plate of an unused slot. (Read that again if you need to, but your imagination is right.) After that, drill two holes through your nearest outside wall. Connect hosing to a 3/4in garden tap and your PC. Don't forget to pass the return hose through the second hole to outside - unless you have tiled flooring. Silastic around the hose and the edges of the holes. It's not necessary, but it is nice to use Silastic on a job somewhere, so I'd recommend doing it.

Turn on the tap and pump up the clock. If you want to be PC, then I guess you will want to use a reticulated water supply. Or maybe you just have a live-in girlfriend. In that case you need a pump and a cooling tower. In these circumstances let me suggest that you invest in one of those girl-friendly Japanese tabletop water fountains with pebbles. Do a neat job and she'll never know that it's a piece of computer equipment.

Ric Techow

It occurs because of a vertigo-like effect where the information being passed to the brain from the inner ear does not correspond with the concurrent visual stimulus. Alternatively, it might be a psychosomatic condition of self-induced nausea triggered by a subconscious desire to continue participation in the real world under the implicit assumption that Half-Life will leave you powerless against its lure, resulting in a behavioural disorder of chronic proportions that manifests in physical means. It might also be something about your mother. We think someone wrote a thesis on this sometime in the '70s.

As for a particular engine causing this effect, perhaps there might be some setting for just the HL engine that restricts the refresh rate of the screen to something that amplifies the effect.

Water on the brain

We all know about all the different types of cooling hardware for PC components, yes? You know, we've got the water cooling, Peltiers, a shit load of fans and, of course, your wonderful fridge PC.

Now tell me: if a motherboard was installed inside a fish tank and the fish tank was filled with mineral oil, what would we have? We would have a PC without any nasty water carrying air around – plus, mineral oil does not conduct electricity. I'm sure there are many ways you could cool this oil down. You could just run a pump, or two, and make the whole fish tank a giant water block. Or just fill the top of the fish tank up with ice. I'm not sure if the oil would seep into the capacitors, but I'm sure we could work around that.

Sounds like fun eh?

Fraggs.

It works. You need Peltiers, a pump and plenty of oil in a large enough case so as to allow good flow. Submerge only the motherboard, CPU (without heatsink), RAM and other cards – leave the other components out, like the HDD and FDD. We don't know how your fish will feel about it, though. They might need little reverse-scuba gear and cardigans.

A nugget of wisdom

I read your article in issue 9 about greasing the CPU fan and power supply fan. Wow! This gave me an awesome idea. I removed the HDD from my laptop, removed the four screws holding the HDD and found the ball bearing, which I then greased with normal Zippo oil. When I turned on the laptop it was damn noisy, and sounded like it was about to crash or something! Windows 2000 loaded sweet – just bad noisy sounds. I removed the HDD again and, this time, oiled it with some lubricant sprayer (it was a yellowy colour that seemed dodgy). Windows 2000 loaded OK, but the noise was worse! I thought it was probably because the oil had not really soaked into the ball, so I left my laptop turned on all night. Next morning, when I checked my laptop, it had crashed. But the worst thing was the noise – it sounded like some workman cutting metal with an electric saw!

So I decided to try CRC 5.56 multipurpose lubricant. Suddenly my HDD was very quiet and even seems to run faster! So, when greasing, use the very expensive oil and make sure it is white – never use the yellow stuff as it will become jelly.

Jin

Atomic does not endorse the above advice.

Munted slots

I've been sticking to Slot 1s and Slot As. Since these are going out of fashion I decided to buy a Socket A processor. The other day I went to a swapmeet and bought a Socket A AMD Athlon Thunderbird 1.2GHz,

along with a GlobalWIN FOP38 Socket A heatsink fan. I came home, got the socket A motherboard I bought earlier and put the processor in the socket and got the ZIF lever down. Then I got the heatsink. I tried and tried to get the clip attached to the holder thingy, but I couldn't do it. So I went to get a flathead screwdriver to do the job; I pushed and pushed and, on the last push, the clip flipped somehow and slit my thumb!

Blood and blood went all over my new motherboard! I did waste \$255 for it, and couldn't get the new one with the warranty. So I cried and cried for the whole day. In fact, I didn't touch my other computers for the rest of that week. Can you please – I beg you – please tell me the correct way of mounting the heatsink?

Michael Cao

As we've discovered in the course of our heatsink fan round-up, certain Socket A HSFs are a total bitch to mount. Just a few tips for you:

- 1. If it's a tight fit, pre-bend the clip so it isn't as hard to mount.*
- 2. If it's really difficult, take your motherboard out of your case and work on a flat surface.*
- 3. The assistance of another person can make the job a lot easier.*
- 4. Keep the heatsink fan PERFECTLY flat on the CPU when mounting. Stick to these ground rules and you can't go wrong.*

Bags of fun

I am impressed with the new Logitech MOMO steering wheel you reviewed in the last issue – realism is gaining pace. I was wondering if you could check with the relevant offices to gain an assurance that the government will not be introducing ADRs for this kind of wheel, and that regulations will not be introduced to make manufacturers include airbags on devices such as this. It would be one thing to crash a \$500,000 Lamborghini with force feedback; it would be another to have a protection device go off at the same time – it would block the graphics.

Strangely enough, the government has forced us to wear seatbelts to save emergency workers time when finding the body after a crash – it stays in the car. Now they have airbags so the body isn't so badly damaged that the workers' sensitivities are offended. It isn't difficult to imagine this could be applied to computer games as a new vote winner. We need assurance that our rights as gamers are protected.

Vicar

Kill like a gentleman

OK, that's [expletive deleted] it! I think I speak for all the normal online gamers out there who play CS, DoD, and any other online games when I say, I've [expletive deleted] HAD ENOUGH OF ALL THOSE [expletive deleted] WALLHACK, AIMBOT, OPENGL HACK, [expletive deleted] LET'S SHOOT YOU IN THE HEAD THROUGH TEN WALLS FROM THE OTHER SIDE OF THE MAP CHEATING [expletive deleted] RETARDS!!! . . . *ahem* . . .

Seriously, when are those testicular parasites going to realise that it's not funny to cap an entire team with headshots using a para from the other side of the map with your back turned to them? I am all for PunkBuster, and I think Valve should get its anal retentiveness in order and integrate PB in all of their online games.

The majority of gamers out there expect to connect to a decent server, and play a fair game (excluding pings and 1337 skill levels, of course). But what do they get? CHEATING MORONS WHO CHEAT BECAUSE THEY'RE EITHER TOO PUSSY OR TOO [expletive deleted] TO [expletive deleted] PICK UP A COLT AND AIM BY THEMSELVES INSTEAD OF GETTING SOME HACK TO DO IT FOR THEM!

Therefore, I'm starting an international organisation; it's called 'YAIM'. Not only does it ask the shortened question of why use aimbot, it also stands for YOUR ARSE IS MINE. We will track your cheating arses down, and lay the smackdown on your cheating little bitch hoes until you can't cheat no more! We know where you live. The can of whoop arse will open! Cheat, I dare you [expletive deleted]!

BaaL

The Atomic CD

Energise your PC with Atomic power. You won't find a pack of tools like this anywhere else. It's actually useful! No games, no movies, just spanner-loads of fix-it-up stuff for those tired PC days.

Atomic and CD. Those two words don't usually go together in the same sentence, unless the sentence is 'Cover CDs suck - I'm glad that Atomic doesn't run one.' Foregoing the horrid cover-mounted coaster is usually quite easy for us - after all, who needs a bunch of game demos that are already six weeks old by the time you get them?

No age-old game demos here! The Atomic CD is a 'first boot' CD, designed to be used after each and every OS install. We all know how big a job a format and reinstall can be. Hours of gaming time goes down the drain, wasted, as you search in vain for that elusive CD that houses your precious prOn collection. While we can't help you with that (officially anyway), we *can* save you time when it comes to finding and reinstalling all the programs, drivers, tweaks and benchmarks that you absolutely must have on your beloved not-so-beige-anymore box.

Firewalls, burning programs, graphics card drivers, overclocking utilities, 3D modelling programs (for all you zany people in the game mods scene), instant messaging apps, benchmarks, audio rippers, Net sharing apps, backup and restore programs, DVD apps - you name it, we probably have it.

Unfortunately, there is only a finite amount of space on any one CD. A heated debate ensued over which applications should be excluded from our CD, and for a time the Atomic office resembled a scene from Counter Strike as differing factions fought for their respective causes. Eventually, a winner emerged and thus, our huge list of vital applications, tweaks, benchmarks and utilities that started life as more than 1GB of philez, finished its life as a list containing just under 600MB of files.

Please note that the HTML interface on the CD is best viewed at 1,024 x 768-pixel resolution.

Drivers

Drivers, drivers, drivers galore! Mostly video card drivers, but still drivers galore! We think we have you all covered with this beautiful selection.

Included are: NVIDIA Detonators, 3dfx drivers for Voodoo3, 4 and 5 series cards, KYRO and KYRO II drivers, Matrox drivers for Millennium 450/400/200 and pre-200 series cards, ATI drivers for All In Wonder and Radeon cards, and Hercules Game Theater XP sound drivers.

Unfortunately, we were unable to include any kind of drivers from Creative, due to legal restrictions.

Tweaks 'n' stuff

We have plenty of tweaks and general programs that are absolutely essential for any format and reinstall. Our tweaking section includes: TweakUI, XP PowerToys, Rage3D Tweaker, PowerStrip, Hercules 3D Tweaker, NVMax, Kyro Tools XP, HZTool, Detonator Destroyer, and more.

The General section includes: Acrobat Reader, DivX 4.02, DivX 3.11a, QuickTime Player, RealPlayer 8.0 Basic, Winamp, mIRC, ICQ 2000b, MSN Messenger and Roger Wilco.

Benchmarking

What's the use of overclocking every piece of hardware you own to within a mV of its life if you can't test the resultant performance boost? Sure, if it starts smoking or melts all over your motherboard, you know that the OC was perhaps a tad over-ambitious. However, unless the aforementioned happens, how can you tell? You benchmark!

3DMark2001

If you have a GeForce 3 or Radeon 8500, this is the benchmark for you! If you don't have one of these cards, 3DMark 2001 is pretty much useless as a reliable benchmark, and you must use 3DMark 2000 (also included on the CD).



SiSoftware Sandra 2001te

Ever wanted a program that will gather a massive amount of system and hardware information into one place? If so, Sandra is for you. With 50 different benchmarking, information and diagnostics features, Sandra is a dream come true for information junkies who absolutely must know about every last facet of their system. The registered version includes a further 20 diagnostic tools.

Also included in our Benchmarking section: Vulpine GLMark, Quake 3: Arena AtomicMPC Demo, Video2000, Nero CD Speed 2000, WCPUID, MemTach and Q3Bench.



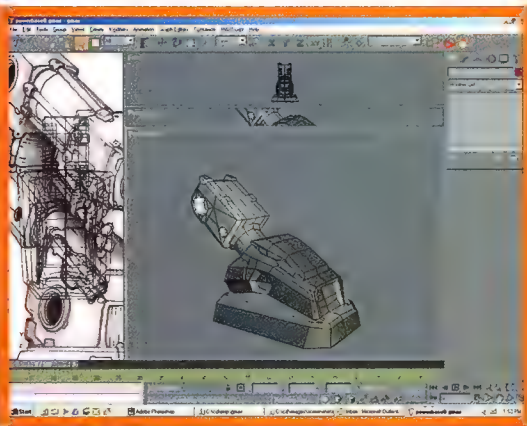
Utilities

What computer is complete without utilities? Heck, besides games, is there any other reason for owning a PC? We don't think so. There are literally millions of utils out there for you to play around with; however, only the following were considered important enough (and by extension, {337 enough) to be included on the Atomic 'first boot' CD.

gmax

Based on the industry standard 3D modelling tool, 3ds max, gmax is a free content creation tool for gamers. Create your own characters, weapons or levels – gmax can do it all. The usefulness of gmax is further extended by game developers, who can release their games with gmax 'game packs.' Game packs link a game's 3D engine to the gmax program, allowing much tighter integration between the two and thus more flexibility in editing and content creation for your games.

There is no other program available that can compare with gmax. Best of all, gmax is totally free! The only real restriction is that you must be online in order to install the program.



Tiny Personal Firewall

If you have a broadband connection to the Net, or even if you are on a prehistoric 33.6K dialup connection but spend a lot of time online, you need to run a firewall – and Tiny Personal Firewall is arguably the best consumer-level software firewall available.

Although relatively difficult to set up properly, Tiny Personal Firewall by far gives you the greatest degree of control over exactly what goes into and out of your network. Features such as MD5 hashes

g max

on program binaries are especially useful, ensuring that Trojans cannot gain Net access from your computer by masking themselves as legitimate programs that you have already given access to.

Exact Audio Copy

Everyone likes music. More specifically, everyone likes MP3s – well, everyone except the RIAA of course.

Written by a German programmer, Exact Audio Copy would have to come close to being the best CD audio ripper in existence. At times the program can be extremely slow to rip, as it will re-read bad sectors up to 82 times, comparing the results of each read in order to get a good quality rip of that sector. However, if you prefer fast rips (as you would when the CD is a good quality one with few scratches), there are options to turn off the advanced error checking and correction techniques.

Also included with EAC is a small but useful WAV editor, whose main function is to edit out clicks, pops, noise and other artefacts.

There is a new version of EAC - incorporating several major bug fixes and new features - that should be out by the time you read this.

Nero Burning Rom


Nero is more than a burning application – it's a total burn solution. From DVD-RW to VCD to plain old CD-R, Nero can do it all. Nero even includes a virus scanner for scanning CD layouts before they're burnt. Need to make a bootable CD? Nero does it with ease. Overburning? No problem. In short, Nero is simply the best total burning solution available today.

ConfigSafe Standard Edition

Ever wanted the ability to turn back time? ConfigSafe lets you turn back time on your system by providing a comprehensive backup and restore function, allowing you to restore your system to a point in time where it actually worked. Through the use of a combination of automated and manual system 'snapshots', ConfigSafe keeps note of key system aspects of your system such as the Registry, config files, file versions (on DLLs and the like), installed hardware, and network connections available. All in all, a very good backup and restore program for people who want a 'set and forget' solution.

DVD Genie

Ever been annoyed by the DVD zoning system? Ever been frustrated when you are given a DVD at Christmas, only to find that it absolutely refuses to play on your DVD player? DVD region encoding is something we all have to live with, mainly thanks to American movie companies. However, programs such as DVD Genie make the zoning system easier to live with. DVD Genie acts as a type of 'middleman' between your DVD hardware and the DVD software playing your disc. Because Genie sits between the two, it can perform DVD region changes on the fly, which will enable you to play any DVD from any region zone across the globe. This is obviously a good thing for anyone who enjoys DVDs.

Also included in our Utilities section are: WinGate, CuteFTP Pro, WinZip, WinRAR, FlashGet, Motherboard Monitor and Zone Alarm. 



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Intel Pentium IV 1.6GHz	\$415
Intel Pentium IV 1.8GHz	\$615
Intel Pentium IV 2.0GHz	\$1345

Motherboards

Asus A7V266E VIA KT266A	\$329
Asus A7V133 VIA KT133A	\$259
Asus P4B Intel 845	\$357
EpoX 8KHA+ VIA KT266A	\$250
ECS P4VXAS VIA PX266	\$219
Tyan Tiger MP AMD 760MP	\$525
Tyan Thunder K7 AMD 760MP	\$1099

Hard Drives

IBM Deskstar 20GB 60GXP	\$215
IBM Deskstar 40GB 60GXP	\$284
IBM Deskstar 60GB 60GXP	\$415
IBM Deskstar 75GB 75GXP	\$598
Western Digital 20GB WD200BB	\$202
Western Digital 40GB WD400BB	\$258
Western Digital 60GB WD600BB	\$360
Western Digital 80GB WD800BB	\$492
Western Digital 100GB WD1000BB	\$630
Western Digital 120GB WD1200BB	\$775

Video Cards

Asus V7100 32MB GeForce2 MX400	\$225
Asus V7700 64MB GeForce2 Ti Deluxe	\$475
Asus V8200 64MB GeForce2 Ti5 Deluxe	\$959
Prolink 64MB GeForce2 MX400	\$160
Prolink 64MB GeForce2 Titanium	\$285
Prolink 64MB GeForce3 Titanium 200	\$572
ATI Radeon 7500 64MB	\$489
ATI Radeon 8500 64MB	\$726

Soundcards

Soundblaster Live! DE 5.1	\$123
Soundblaster Audigy	\$212
Soundblaster Audigy Platinum	\$444
Soundblaster Audigy Platinum Ex	\$498
Hercules MUSE XL	\$60
Hercules GameTheatre XP 6.1	\$293
Hercules GameSurround Fortissimo	\$115
Philips Acoustic Edge	\$145
Philips Seismic Edge	\$245

CDROOM/DVD

LG 16X DVD-ROM	\$125
LG 52X CDROM	\$70
Pioneer 16X DVD (Slot)	\$160
Pioneer 16X DVD (Tray)	\$148
Samsung 12X DVD (PowerDVD Software)	\$119
Samsung 16X DVD (PowerDVD Software)	\$130
Sony 16X DVD-ROM	\$125

CD-Writers

Sony 32X/16R/10RW CDRW	\$226
Asus 40X/24R/10RW CDRW	\$368
Ricoh 40X/20R/10RW CDRW	\$275
Plexor 40X/24R/10RW CDRW	\$580

Memory

256MB PC133 SDRAM	\$60
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512MB PC2100 DDR SDRAM	\$220
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Monitors

Hitachi CM615 17" Monitor	\$389
Hitachi CM621F 17" Monitor (Flat)	\$480
Hitachi CM721F 19" Monitor (Flat)	\$781
Hitachi CML152XW 15" TFT	\$940
Hitachi CML170XSW 17" TFT	\$1599
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Samtron 76E 17" Monitor	\$360
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Samsung 955DFX 19" Monitor (Flat)	\$889
Samsung 560V 15" TFT	\$749
Samsung 770T 17" TFT	\$2369
Samsung S180T 18" TFT	\$3330
Samsung S210T 21" TFT	\$10656
Sony CPD-E220 17" Monitor (Flat)	\$646
Sony CPD-G420 19" Monitor (Flat)	\$1325
Sony CPD-G520 21" Monitor (Flat)	\$2142

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Boston Acoustics BA7500 Dolby Digital	\$583
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Klipsch Pro Media 2.1 Speakers	\$396
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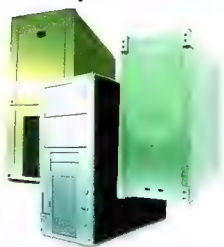
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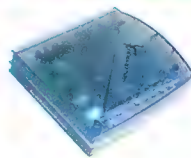
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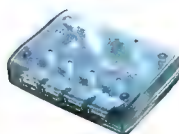
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Swann Security Products

MicroCam

2.4 GHz Wireless Ultra Miniature Camera System

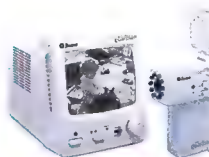
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- Simple to install, just plug in to any video device, such as a VCR, TV or security monitor and play
- Superior quality CMOS colour lens
- Up to 100m transmission range
- 1 year "Hassle Free" warranty



More security products arriving in December.

SpyCam Miniature video camera

- Low cost security
- Tiny size for undetected surveillance
- Easy installation
- Connects to a TV, VCR or security monitor
- 1 year "Hassle Free" warranty



Wireless Guardian Wireless security monitor and camera

- Monitor your children, home or workplace
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- Infrared LEDs for night vision
- 1 year "Hassle Free" warranty

Swann SpyCam LongView Lens

- Increase the viewable area of Swann's SpyCam
- Improves clarity and picture over longer distances
- So easy to install - simply unscrew the standard lens and screw on the LongView Lens
- 1 year "Hassle Free" warranty



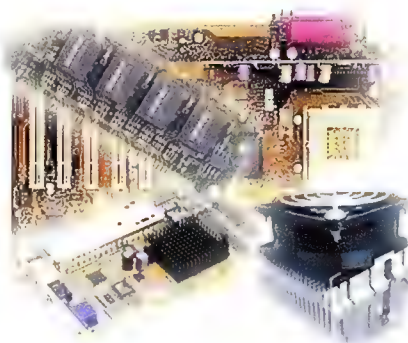
Swann SpyCam Video Extension Cable

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- Plug 2 extension cables for twice the distance
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- Compatible with any video device with RCA connectors
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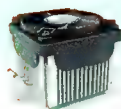
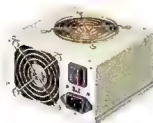
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AMD K7 Athlon 1.2 Ghz B/C	\$229 / \$229
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30 GB 7200 rpm Hard Drive	\$228
40 GB Hard Disk Drive	\$203
40 GB 7200 rpm Hard Drive	\$259
60 GB Maxtor Diamond Max 7200	\$340
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Asus A7V133 Socket A M/B	\$307
Asus A7A266 DDR & SDR M/B	\$325
Asus A7V266 DDR Skt A	\$359
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300 Watt Power Supply ATX	\$ 35
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Creative SB Live DE 5.1 SE.....	\$120
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Creative Audigy DE.....	\$210
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Leadtek Gf3 Ti-200 64mb TV/DV\$620	
Leadtek Gf3 Ti-500 64mb TV/DV\$890	
Matrix G550 32mb.....	\$310
MSI Gf2 Pro 64mb TV out.....	\$320
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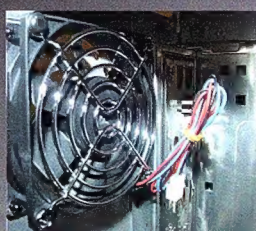
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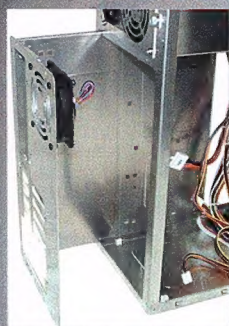
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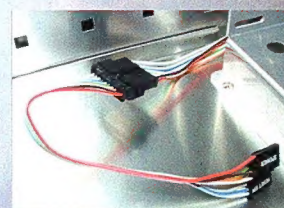
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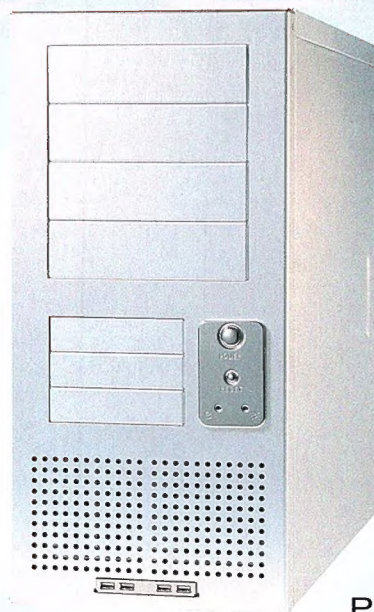
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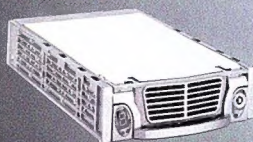


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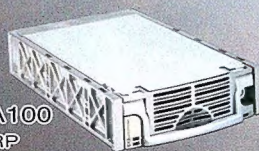


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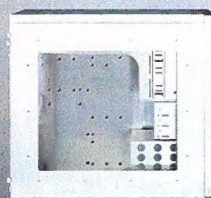


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Irrelevant Milestones in Gaming

As Christmas approaches, it often makes us feel nostalgic, remembering all those fantastic games that were given as gifts, or purchased with the proceeds of the refund you got on the jumper that your grannie gave you, or that were part of the whole Chrissie games bonanza.

In honour of these games, and because we have gone almost a year without having had a 'best 50 games of all time' feature from anyone, we have compiled a list of awards for some special gaming memories – the Atomic Irrelevant Milestones in Gaming.

- Most memorable game mirror – In the bathroom of the theatre in Duke Nukem 3D. This mirror has witnessed more inane jumping up and down than any other mirror in gaming history.
- Lamest reference to Michael Douglas – Gordon of Gecko in Fallout 2. This character existed solely to remind us that greed was good, so most people killed him and robbed his corpse.
- Worst attempt at flogging a tech demo as a game – Quake 3: Arena. Despite what its detractors say, Quake 3 still beats the free game demo in 3DMark2001 hands down in benchmarkability – and Expendable was too playable.
- Stupidest sports game – Boot Camp by Konami. A stick-waggler of old. Rather than competing in any lightweight sporting events, Boot Camp replicated the action-packed environment of Marine training. Riveting.
- Most redundant use of a 'winners don't use drugs' ad – Narc. Remember the good old days when nearly every game had a 'winners don't use drugs' message from the FBI? Well, Narc was a game that revolved around the brutal slaying of drug dealers, thus reinforcing that winners don't use drugs – at least not for long. But it still had that FBI message.
- Finest use of citrus as headwear – Lemonhead in The Secret of Monkey Island. This native of Monkey Island, with his oval,

yellow headwear, scrapes it in by a nose. Of course, because of the lemon we don't know if he had a nose.

● Least memorable Sid Meier game – Solo Flight. This had all the ingredients necessary to be a hit back in 1985, with CGA graphics and the Sid Meier moniker. Unfortunately, the riveting action did not involve smoking Migs over Korea or dogfighting over London. You flew mail routes across the US, and that's it.

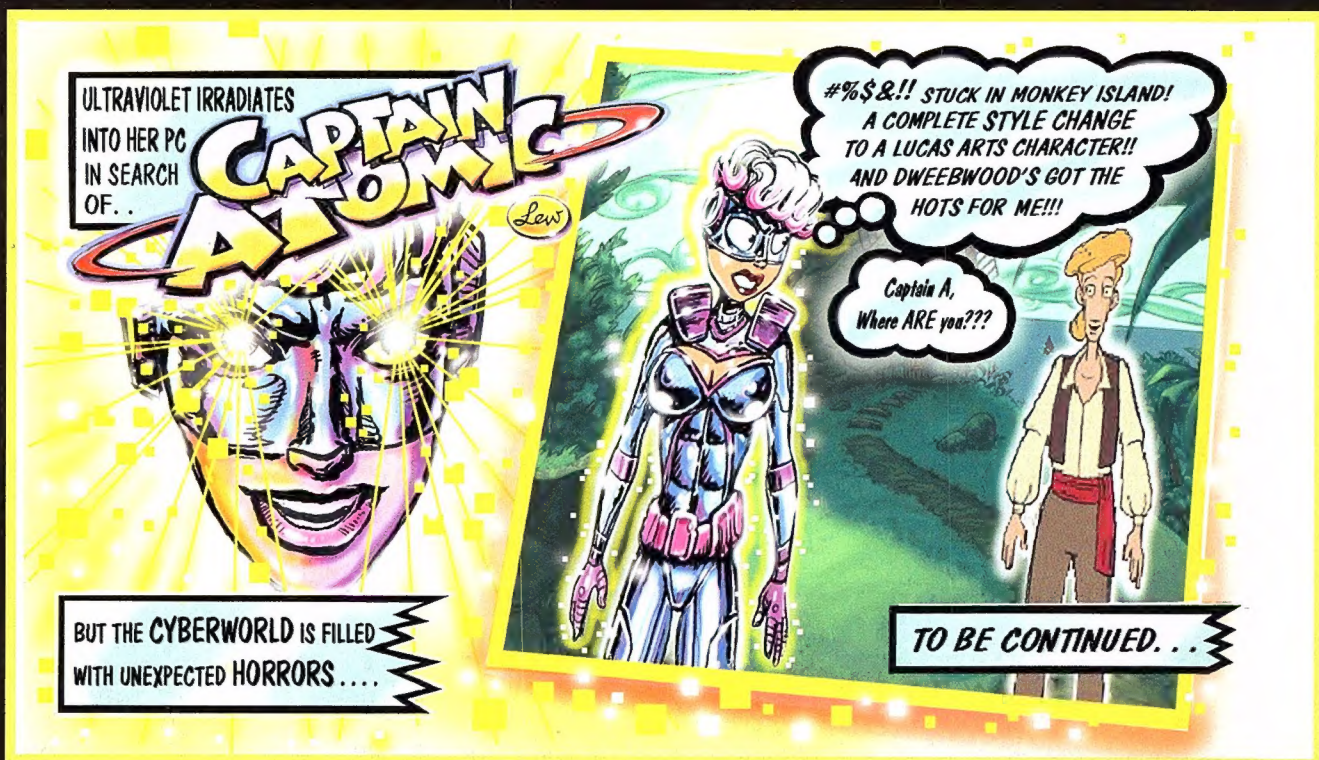
● Worst appearance by Mark Hamill in a Wing Commander game – Wing Commander 4. By that point even the allure of 'Hey, wasn't he Luke Skywalker?' had worn off, to be replaced by 'Wouldn't it be cool if an FMV producer actually found someone who could act?'. The worst part was that because WC4 was 90% interlaced FMV, he was onscreen a lot.

● Most pointless use of a marching band – Postal. While no-one actually knows whether this 'run around and massacre members of the general public' game had any point at all, the scene involving a marching band and a heavily armed nutcase sticks in the memory, usually followed by the question 'Why?'.

● Most comprehensive support of TEN – Shadow Warrior. Lo Wang and his sassy stereotypical banter were fantastic, but even better when played over a laggy, now dead multiplayer gaming service.

● Lamest monkey in a game – Black and White. For a game in which the animals were supposed to show advanced levels of artificial intelligence, the fact that none of the monkeys ever engaged in spontaneous bouts of masturbation was, frankly, an unforgivable oversight, ruining what would have been a fine game.

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